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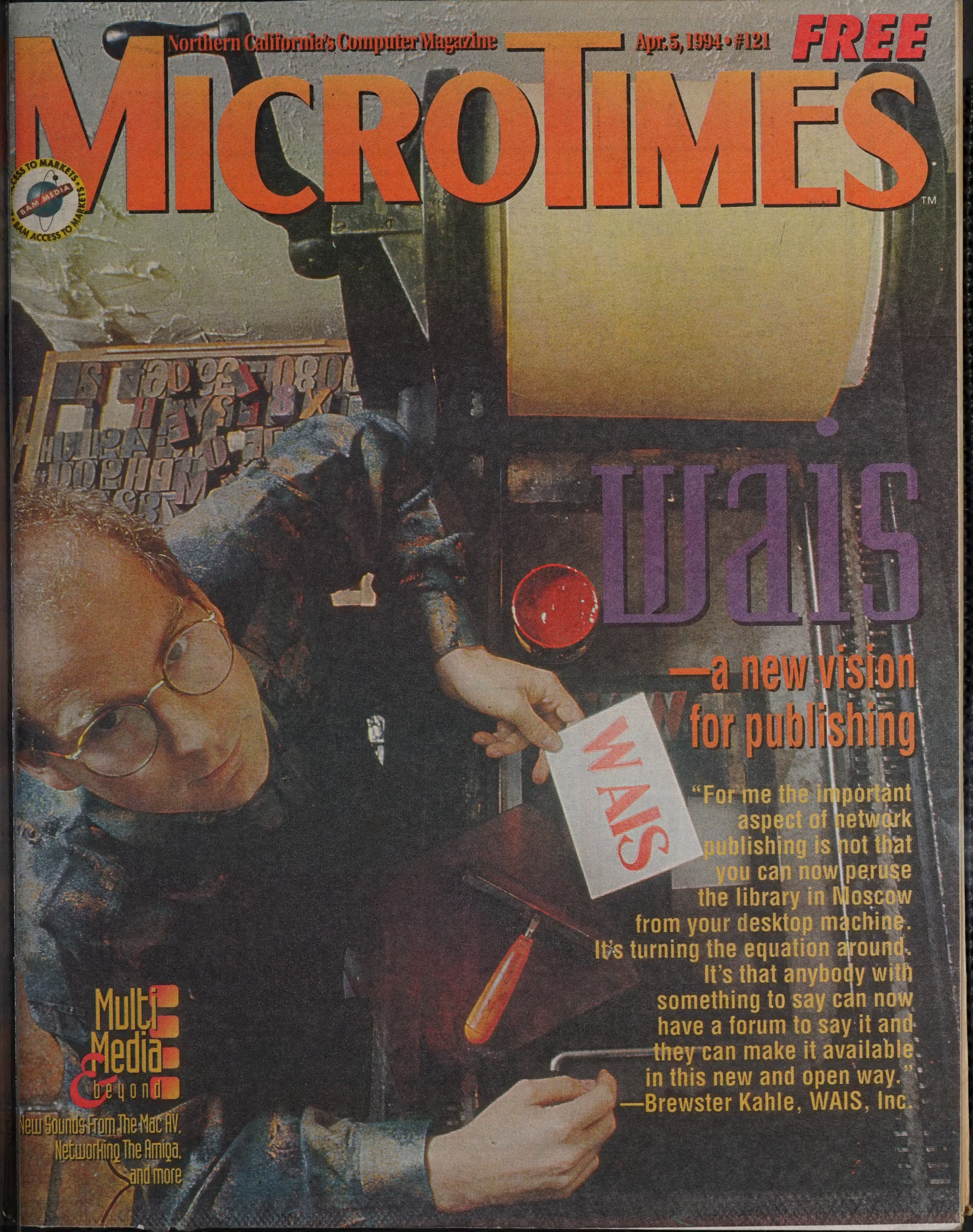

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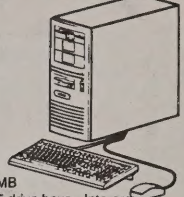

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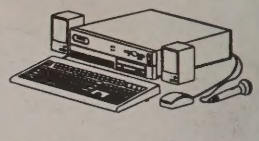

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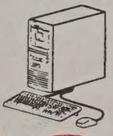

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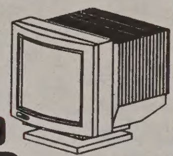

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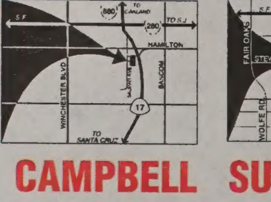
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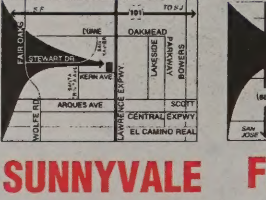
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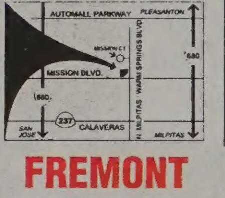
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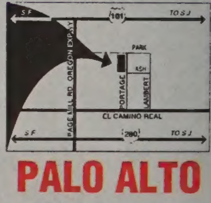
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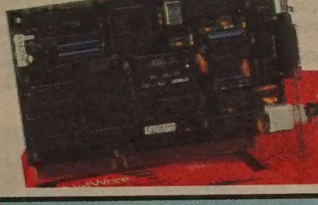

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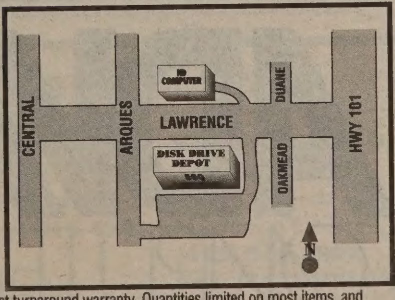

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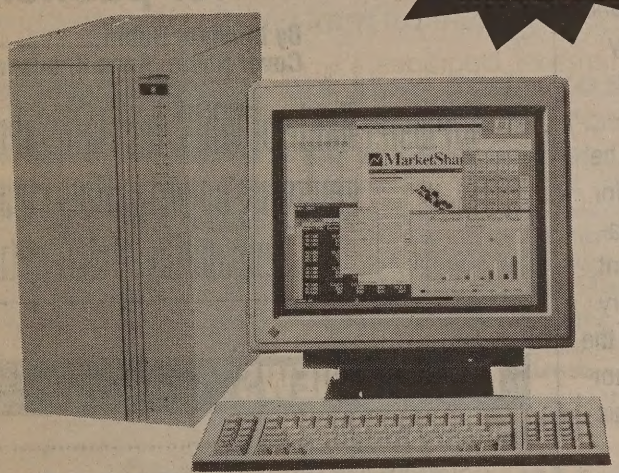

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Desktop publishing was only the beginning. Now it's possible for someone in California to read documents from all over the world as if they were on the desktop computer, and possible for any author with net access to "publish" globally. The implications—for business, education, government, and almost every other aspect of the culture—are enormous, and in this month's cover story, Michael Robin talks with Brewster Kahle about some of them. We hope you find it interesting and that it inspires you to go sample the world of online publishing.

—ME

Micro Marketplace

A Special Advertising Section For **Northern California Computer Buyers**
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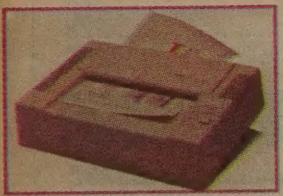

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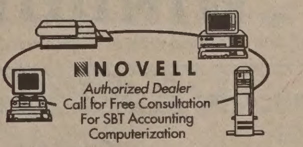

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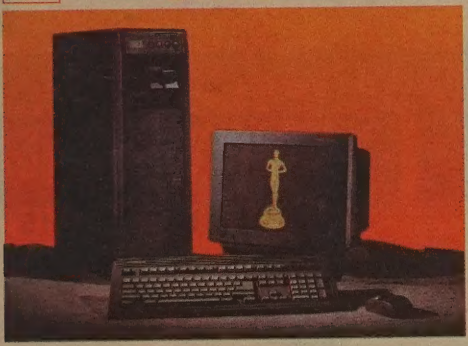

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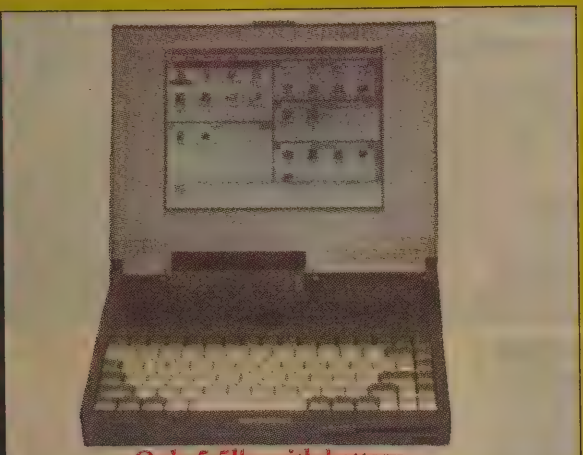

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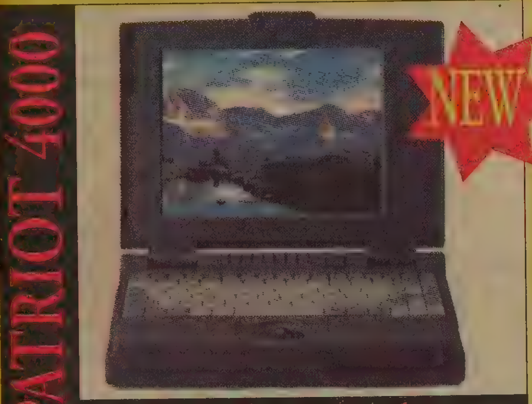

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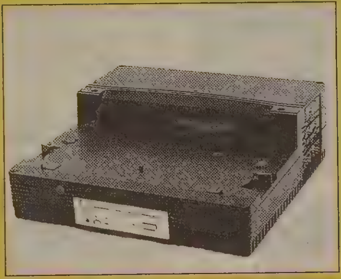

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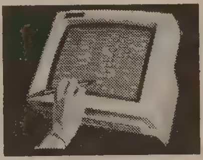

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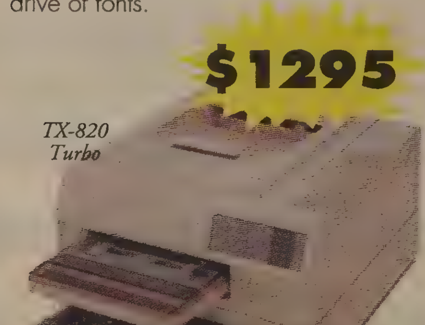

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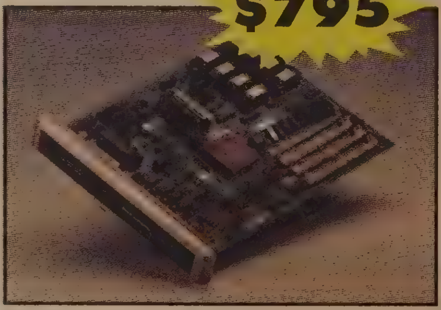

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INDUSTRY INSIGHT

Software Patents:

Stac Wins Suit Against Microsoft DoubleSpace To Be Removed From MS-DOS

BY PAUL HOFFMAN

Stac Electronics has won a major patent infringement lawsuit against Microsoft, forcing the giant software company to remove its popular DoubleSpace software from all versions of MS-DOS v6.0 and 6.2. As a result, new purchasers of MS-DOS will not be able to use the free disk-compression software.

Microsoft was also ordered by the jury to pay Stac $120 million for damages. At the same time, Stac was found guilty of using Microsoft trade secrets and was told to pay $13.7 million in damages to Microsoft. The case involved a software patent owned by Stac for a specific type of data compression.

The lawsuit will have a major effect on MS-DOS users who need more disk space. When DoubleSpace was first introduced in MS-DOS v6.0, it was one of the most highly touted features of the new version because it kept users from having to spend hundreds of dollars on compression utilities. Before v6, a few utility vendors such as Stac sold add-on products, but they did not always work well with MS-DOS. When DoubleSpace was released as part of v6, the market for other compression programs essentially disappeared and Stac was pretty much wiped out (Stac also sells a compression program for the Macintosh).

Copyright © 1994 by Paul Hoffman. All rights reserved. Paul Hoffman is an industry analyst who has been covering microcomputer technology for fifteen years. He also writes popular computer books and is the president of Proper Publishing. He can be reached at phoffman@netcom.com.

After the jury's decision, Microsoft released MS-DOS v6.21, which is the same as 6.2 but with DoubleSpace removed. All copies of v6.2 that had not been sold were recalled, and computer manufacturers were told to install v6.21 exclusively. Microsoft makes much of its MD-DOS profits from hardware manufacturers, and the change caught many of them off guard, especially manufacturers of portable systems, which typically have much smaller hard drives and thus rely more heavily on DoubleSpace.

Stac professed itself perfectly happy with Microsoft distributing v6.21 without DoubleSpace. Not only does Stac get a huge compensation for its lost market, that market will reopen for new sales to MS-DOS users. Of course, Microsoft can develop a version of MS-DOS with disk compression that uses a non-infringing method, at which point Stac will again have no market. In fact, many people in the computer industry wonder why Microsoft didn't use any of the many publicly available compression algorithms instead of the one they chose.

> When **DoubleSpace** was released as part of MS-DOS v6, the market for **other compression programs** essentially disappeared and **Stac was pretty much wiped out.**

Microsoft also made a point to assure current DoubleSpace users that they can continue to use DoubleSpace as they do already. As a consequence of Microsoft's payment of damages to Stac, Microsoft customers are essentially getting a paid-up license to the technology for whatever software they bought. Microsoft will also continue to support users who have problems with DoubleSpace through its technical support lines as it always has.

The small part of the suit that Microsoft won against Stac involves information that Stac learned during the beta test of MS-DOS v6. They used the method Microsoft was going to use to "pre-load" the compression driver. Stac claimed that this was an undocumented interface, while Microsoft successfully convinced the jury that it was a trade secret and stolen by Stac. Some software vendors are now worried that Microsoft will start prosecuting competitors that use undocumented interfaces that appear in beta copies, although it is likely that Microsoft simply used this tactic to try to scare Stac during litigation.

As you probably guessed, both companies will appeal the decisions against them. It is also likely that some of the jury's decisions will be changed by the trial judge or other judges during the coming months. The end effect on users should be negligible (except for Stac shareholders), but in the short term it will definitely make it harder for people who were going to rely on disk compression as part of new systems. Some manufacturers of portable computers are already talking to Stac about licensing their software for inclusion on systems with small disk drives, and others will simply make the user go out and buy a compression package.

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KINGSTAR COMPUTERS

CHEAP DOESN'T MEAN EASY: PORTABLE COMPUTERS IN 1994

Many major companies like Compaq and Dell are saying that the portable computer market will make them or break them this year. Almost every major PC company is releasing redesigned computers, often with lower price tags than last year. However, the manufacturers are finding resistance from the people who they hoped would buy the portables, and a major shakeout appears imminent.

It doesn't have to be that way. While price is important, it isn't the only thing that users look for when they buy a portable. Last year's spate of announcements of cheaper, faster, and less power-hungry CPUs has made it possible to shave 20% to 40% off the price of a portable system. Many computer manufacturers assumed that this drop in price would drive tens of millions of users to the portable market. Most have completely overlooked the other factors that are keeping many first-time portable buyers away—the screens, the trackballs, the ruggedness; in other words, the feel of the machine.

The PC market has long been plagued with a rampant me-too attitude about design. After all, most of what can be changed but still be considered part of the mainstream is just the design details, such as the feel of the keyboard, the location of the connectors, the shape of the box, and so on. For desktop systems, the design became less important than speed, disk capacity, and price. The same has never been true of portables.

From the beginning, the screens on portables have been hard to read. Although the LCD screens on today's portables are much better than those of five years ago, that isn't saying much. A system with an adequate screen can cost $500 more than a system with a bad screen, or 20% of the cost of the system. Now that color is almost a necessity for Windows users, the high-end portables all have expensive (but still hard-to-read) color LCD screens. Many people who don't have portables correctly suspect that using them is hard on the eyes.

Veteran portable users complain of many other strains as well. Due to the nature of the machine, the screen on all portables is just above the keyboard. This forces you to look down when you work, causing neck strain. Further, many portables (particularly the "subnotebooks," the lighter of the portables) have very cramped keyboards, adding wrist strain to the neck strain.

The worst design feature of most current portables, however, is the pointing device. Every trackball and slider has its advocates and its detractors, but few people who use both a portable and a desktop system prefer the portable for using Windows. The trackballs on many portable PCs are tiny, forcing the user to aim very carefully. Worse yet, some new designs put the trackballs in places that will strain the wrist even further, such as on the screen or on the edge of the computer. It is really amazing what some manufacturers are doing with the trackballs in the name of saving a few ounces or inches on the system.

You can see how little thought goes into the physical design of portables at some companies by comparing different models from the same company. For example, IBM's Ambra division has two system families, the SN (subnotebooks) and N (notebooks with larger screens). On the SN, the trackball is in the lower right corner; on the N, it is in the upper right corner.

So, why would someone want to spend $1000 more for a system that is physically difficult to use? For many people, portability is almost secondary to the fact that portable computers are also tiny. As people in the Los Angeles area now know, telecommuting is more than a fad. It can be the only way to work for many people. Yet few of these people want to devote an entire desk to a full-sized system, and a portable can be a blessing, even with the associated strain.

A few manufacturers are starting to look at the larger end of the portable market. Apple's PowerBook Macintoshes have generally been heavier, larger, and more expensive than comparable PC portables, and they are selling like crazy. A few daring manufacturers are testing out portables that are a few inches wider and taller than competitors, but do not weigh much more. They are putting the trackball in the same spot as Apple, right under the spacebar where your thumbs already are anyway. They are also testing better screens, even on their low-cost systems.

Price will always be an important factor, but speed may not. Now that manufacturers are starting to understand that communications are much more important than running a spreadsheet for most people, they may start selling systems that are not as fast but have great built-in communications capabilities. It is interesting how many manufacturers have shifted away from offering internal modems as standard equipment and then wonder why their sales are low.

It is also interesting to see how most advertising that shows portable computers in use show people on airplanes or in airports computing away happily. Few of us see these people when we travel; we see portables set up in conference rooms and at friends' houses. Astute marketers should consider showing portable users at home, using a plug instead of the short-lived batteries, with the computer hooked into the phone line. This year, bundling a portable with a good modem, and possibly Lotus Notes, may be the best way to sell systems. ■

While price is important, **it isn't the only thing** that users look for when they **buy a portable.**

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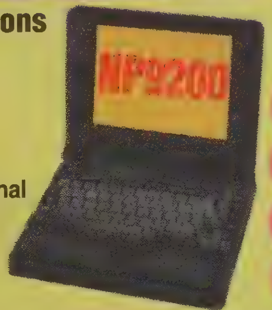

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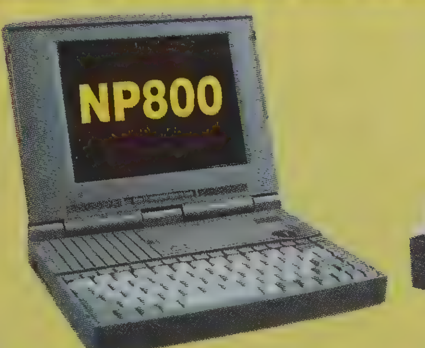

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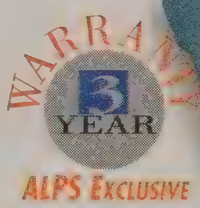

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DOW RETREATS AS INFLATION FEARS PROLIFERATE

A bevy of economic news flooded the stock markets with inflationary fears. The Philadelphia Reserve Bank said raw-materials prices rose in January to the highest level since late 1990, although consumer prices remained unchanged. Some investors interpreted the Philadelphia report as a sign that the Federal Reserve Board may soon take further steps to raise short-term interest rates again. In other news, the US economy rocketed ahead at a 7.5% pace in the fourth quarter, much higher than the 5.9% initially reported. The possibility of excessive growth, coupled with a purchasing managers' report showing price increases in February, tailspinned the market.

For the monthly period ended March 4, the Dow Jones Industrial Average lost 39.12 points, or 1.01%, before closing at 3832.30. The Microtimes Stock Index fared much better than the Dow, as it jumped 7.47%, or 353.01 points, to close at 5081.75.

Lotus Development Corp. said it is meeting with American Telephone and Telegraph Co. on the possibility of working to build Public Notes Servers. Separately, the company expects to add 600,000 new users of its Notes communications package in 1994 to its current base of 750,000. The communications products, which enable the swapping of information among users on computer networks, constitute the software developer's most rapidly growing business. Consequently, Lotus was repeated as a "buy" by Furman Selz analyst Terence Quinn, who said the stock could rise to $80 a share. Shares of Lotus Development jumped $17.88 per share, the largest dollar gainer, before closing at $73.38.

AST Research, Inc., a manufacturer of a broad line of IBM-compatible personal computers, was downgraded to "neutral" from "buy" by both Dean Witter Reynolds analyst Eugene Glazer and Mabon Securities analyst Kevin McCarthy, over concerns about third-quarter results. Bruce Edwards, the chief financial officer of AST, told analysts that third-quarter earnings will fall below their estimates. AST shares closed at $24.00, down $4.75 per share.

Informix Corp., a Menlo Park, California, maker of computer database software, was raised to "buy" from "hold" at Saloman Brothers by analyst John Jones. Jones expects Informix to rise as much as $35.00 a share in the next twelve to eighteen months. The company also received a "buy" recommendation in new coverage from Furman Selz analyst Terry Quinn. In addition, fourth-quarter earnings increased to $0.27 a share, beating analysts' expectations of $0.25 a share. Informix earned $0.23 a share a year ago. Informix gained $6.63 per share, or 38.69%, to close at $23.75.

Dell Computer Corp. was raised to "attractive" from "neutral" by PaineWebber analyst Michael Kwatinetz and to a "strong buy" from "neutral" by Alex Brown & Sons analyst Steve Eskenazi. The company reported fourth-quarter earnings of $0.39 a share, compared to $0.77 a share, one year ago. Despite the decline in earnings, the results were above analyst forecasts of $0.32 a share. Dell shares soared $7.25 per share, or 36.35%, before closing at $27.25. ■

EXCH	COMPANY		TICKER SYMBOL	CLOSING PRICE 02/04/94	CLOSING PRICE 03/04/94	NET CHANGE IN PERIOD	PERCENT CHANGE IN PERIOD	P/E RATIO	ANNUAL DIVIDEND RATE	ANNUAL DIVIDEND YIELD	ANNUAL HIGH	ANNUAL LOW
	SOFTWARE											
OTC	Adobe		ADBE	27.25	28.25	1.00	3.67	23	0.20	0.71	37.00	16.25
OTC	Aldus		ALDC	21.25	23.00	1.75	8.24	32	0.00	0.00	27.75	13.50
OTC	Autodesk	(H)	ACAD	48.75	60.00	11.25	23.08	24	0.48	0.80	60.00	37.00
OTC	Borland	(L)	BORL	13.25	13.38	0.13	0.94	25	0.00	0.00	27.25	12.00
OTC	Informix		IFMX	17.13	23.75	6.63	38.69	29	0.00	0.00	27.25	13.38
OTC	Lotus	(H)	LOTS	55.50	73.38	17.88	32.21	60	0.00	0.00	75.63	23.50
OTC	Microsoft		MSFT	81.25	81.00	–0.25	–0.31	24	0.00	0.00	98.00	70.38
OTC	Novell		NOVL	21.63	24.25	2.63	12.14	–	0.00	0.00	35.25	17.00
OTC	Oracle		ORCL	31.25	34.13	2.88	9.20	50	0.00	0.00	37.75	15.88
OTC	Software Publishing		SPCO	7.50	6.63	–0.88	–11.67	–	0.00	0.00	14.50	5.50
OTC	Symantec		SYMC	15.00	15.00	0.00	0.00	–	0.00	0.00	20.50	10.88
	HARDWARE											
OTC	Apple		AAPL	33.38	36.75	3.38	10.11	–	0.48	1.31	59.13	22.00
OTC	AST Research	(H)	ASTA	28.75	24.00	–4.75	–16.52	–	0.00	0.00	33.00	12.75
NYS	Commodore		CBU	3.13	3.25	0.13	4.00	–	0.00	0.00	5.63	2.50
NYS	Compaq	(H)	CPQ	85.25	98.88	13.63	15.98	18	0.00	0.00	101.88	43.13
NYS	Digital Equipment	(L)	DEC	29.13	30.88	1.75	6.01	–	0.00	0.00	48.25	27.75
OTC	Dell		DELL	20.00	27.25	7.25	36.25	–	0.00	0.00	39.13	13.50
NYS	Hewlett–Packard	(H)	HWP	81.00	89.00	8.00	9.88	18	1.00	1.12	93.63	64.38
NYS	IBM		IBM	52.00	52.63	0.63	1.20	–	1.00	1.90	60.00	40.63
NYS	Silicon Graphics		SGI	25.13	25.25	0.13	0.50	33	0.00	0.00	26.00	11.75
OTC	Sun Microsystems		SUNW	25.50	29.38	3.88	15.20	16	0.00	0.00	36.00	21.13
NYS	Xerox	(H)	XRX	95.00	97.50	2.50	2.63	–	3.00	3.08	103.25	69.88
NYS	Tandy		TAN	44.88	41.63	–3.25	–7.24	17	0.60	1.44	50.75	25.75
	CPU'S											
NYS	Advanced Micro Devices		AMD	20.38	23.38	3.00	14.72	10	0.00	0.00	32.88	16.75
OTC	Intel		INTC	61.75	69.63	7.88	12.75	13	0.20	0.29	74.50	42 75
NYS	LSI Logic	(H)	LSI	17.63	21.25	3.63	20.57	19	0.00	0.00	21.25	10.50
NYS	Motorola		MOT	95.25	104.75	9.50	9.97	29	0.56	0.53	107.50	59.25
	COMMUNICATIONS											
NYS	AT&T	(L)	T	54.88	51.38	–3.50	–6.38	17	1.32	2.57	65.00	51.13
NYS	BellSouth Corp.		BLS	56.63	55.00	–1.63	–2.87	26	2.76	5.02	63.88	50.63
OTC	MCI		MCIC	26.50	25.63	–0.88	–3.30	23	0.04	0.16	29.88	20.69
NYS	Northern Telecom		NT	30.38	30.63	0.25	0.82	–	0.36	1.18	46.00	21.38
NYS	Pacific Telesis		PAC	55.25	54.38	–0.88	–1.58	–	2.16	3.97	59.25	45.00

KEY: NYS = NEW YORK ASE = AMERICAN OTC = OVER THE COUNTER
(H) = NEW HIGH REACHED IN PERIOD (L) = NEW LOW REACHED IN PERIOD

MARKET DIARY:

ADVANCES	23
DECLINES	8
UNCHANGED	1
NEW HIGHS	7
NEW LOWS	3

MOST ACTIVE ISSUES:

LARGEST DOLLAR GAINER	Lotus	$	17.88	
LARGEST DOLLAR LOSER	AST Research	$	–4.75	
LARGEST PERCENTAGE GAINER	Informix		38.69	%
LARGEST PERCENTAGE LOSER	AST Research		–16.52	%

	CLOSE 02/04/94	CLOSE 03/04/94	NET CHANGE IN PERIOD	PERCENT CHANGE IN PERIOD
MICROTIMES STOCK INDEX	4728.74	5081.75	353.01	7.47
DOW JONES INDUSTRIAL AVERAGE	3871.42	3832.30	–39.12	–1.01
STANDARD & POOR'S 500 INDEX	469.81	464.74	–5.07	–1.08
N.Y.S.E. COMPOSITE	261.21	257.70	–3.51	–1.34
NASDAQ COMPOSITE	777.28	790.55	13.27	1.71

CLOSING QUOTES FOR GRAPH:

DATE	MICRO TIMES	DOW JONES
07/22/93	4072.42	3525.22
08/23/93	4264.70	3605.98
09/17/93	4212.67	3613.25
10/18/93	4473.13	3642.31
12/17/93	4644.25	3751.57
01/07/94	4866.50	3820.77
02/04/94	4728.74	3871 42
03/04/94	5081.75	3832.30

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Curing The Software-Monopoly Nightmare

BY JIM WARREN

This isn't a realizable fantasy—it's a realized nightmare! *The problem:*

If you design or write a computer-assisted business process, or spreadsheet macro, or command-line file, or pipe-'n'-filter combo, or wee-tiny object-oriented module—much less any actual subroutine or serious computer program—you better buy a lawyer or two.

Because any trivial problem-solving approach or intellectual process or programming technique you may think of may well be patented—or covered by a now-secret software patent application that won't hit you until years from now. For which you may pay and pay and pay, as a vile patent-infringer.

REALIZABLE FANTASIES

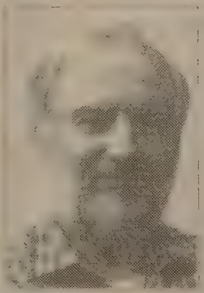
And ignorance of the long-hidden patent application is no excuse.

USERS ARE LIABLE; TRIPLE DAMAGES POSSIBLE

You don't have to *sell* patent-infringing software to be liable.

Simply *using* software that has any iota that infringes a patent makes you liable. Even when the patent is hidden for years, between being filed and being granted by the lawyer-controlled Patent and Trademark Office (PTO, 703/305-9300, fax 703/305-8885).

And you can be forced to pay *triple* damages if you "knowingly infringe"—that is, use a patented routine after you are informed that it's patented. Even if you have been using it for years and your business depends on it.



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THE SUITS ARE COMING! THE SUITS ARE COMING!

Software has long been protected by copyright and trade secret. No problem.

Then Lotus extended the limited principle of controlling right-of-copy to the much broader notion of "look and feel" in their litigation lunacy against underfunded Paperback Software—and destroyed that small publisher of low-cost software-in-a-book.

Furthermore, five years ago the US signed the Berne Convention protecting copyrights. It includes "moral rights" of the originator to control the "artistic integrity" of their creations; a right that cannot be waived. Just think of how the mind-monopolists will apply *that* to any routine any computer user dares to use.

Client-hungry intellectual-property attorneys are grabbing at the doorways of our minds. They are well on their way to placing toll-gates on our ability to write computer programs—with patents that monopolize anything that *works* like any patented procedure for seventeen years—or twenty years, if PTO Commissioner Bruce Lehman has his way.

COMPUTER-ASSISTED "BUSINESS PROCESSES" PATENTED

Software progress and leadership aren't the only things being threatened. "Business process" patents are being used to monopolize more and more business practices—*especially* those assisted by computer. Even when the software does little more than automate functions that have been done manually for many decades—or are business procedures that would have been done manually if people could move fast enough.

E.g., Merrill Lynch patented a "cash-management account" process for sweeping checking account funds into a higher-interest, market-rate fund, and returning them when needed to cover a check. Another firm patented computer-assisted annuity management practices that have been done manually for many decades.

FUNDAMENTAL PRINCIPLE

Traditional inventions enhance our *physical* capabilities—gadgets, physical processes, etc.—undoubtedly as envisioned by the Constitution's framers when they authorized patents "to promote progress."

But most software is fundamentally different: Software is what occurs between stimulus and response—with no physical incarnation other than as representations of binary logic.

Software mimics the mind. It enhances our *intellectual* capabilities.

And our ability to enhance our personal intellectual processes—with or without machine assistance—is just too precious to be monopolized. Not even for IBM and AT&T.

1. BAND-AIDS FOR THE CANCER

As long as the government continues to endanger the nation's fastest-growing industry, at least it can treat some of its more outrageous lesions:

- Immediately recall all software patents for rereview and possible revocation, since *numerous* patents were granted for obvious, nonnovel processes and ridiculously broad claims.
- Mandate disclosure upon filing or—say—within thirty or ninety days thereafter,

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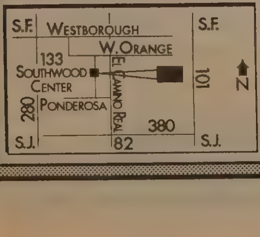

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like many other high-tech nations.

- Require disclosure upon filing of complete source code and complete internal documentation, since a major principle of patents is complete public disclosure by "best mode."
- Reject all applications filed after *any* public exposure, just like many high-tech nations (which at least might hinder vaporware).
- Instead of requiring "clear and convincing" evidence to invalidate a patent, have no presumption of validity at all, since the PTO grants software patents without access to the half-century of prior art.
- Reduce the protection period from seventeen or twenty years, down to, say, two years, recognizing software's short life, and low cost and high speed for reproducing and marketing it, unlike most *real* "inventions."
- Assign patent rights to the first-to-file, rather than the first-to-invent, just like almost every nation in the world—to at least get the threat out in the open, early—while retaining the principle that prior art *always* invalidates a patent.
- Declare that software processes and practices useful for communicating between a machine and a human cannot be monopolized (the "look and feel" idiocy).
- Mandate cross-licensing, limiting total fees to, say, 5% of the licensee's total profits from the licensed tidbit, so the nation's software industry can *partly* continue its growth and vigor of the pre-monopoly half-century.

Software mimics the mind. It enhances our *intellectual* capabilities.

- Have the PTO build what it can of a limp-along prior-art database, nationally accessible via the Internet.
- Require that software patent examiners be technically literate in software.
- Create a large public advisory body of *technologists*—rather than lawyers—that communicates publicly via the nets, to help the PTO develop policies and *slightly* reduce its more bizarre software patent errors.

2. REDRESS OF OUR GRIEVANCES

It's clear that PTO Commissioner Lehman, a longtime DC lawyer and political activist, won't offend IBM, AT&T, and the like—much less the swarm of intellectual property attorneys leaping into the software patent feeding frenzy.

There is *only* one way for computer users and programmers—and software publishers preferring to compete in the marketplace than in court—to fix this problem: organized, highly targeted pressure on Congress and the White House, backed by local political action as needed.

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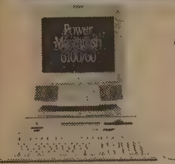

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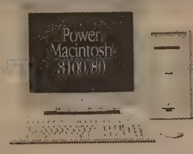

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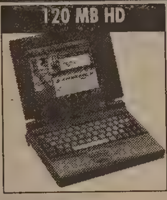

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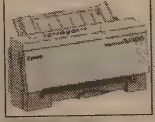

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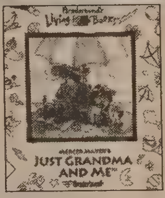

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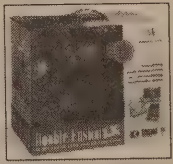

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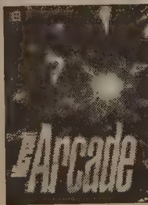

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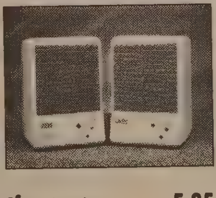

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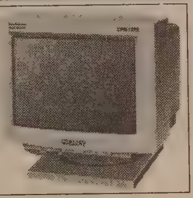

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5. GUERRILLA WARFARE

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Anyone can review software patents and compare them to those companies' current products.

And anyone can send notices to said companies, detailing how they may be infringing various explicit patents. And to their major shareholders. And to Fortune 500 companies using their products. Sent by certified mail. With certified copies to the patent holders and to the PTO Commissioner. Perhaps with copies to the League for Programming Freedom (Box 9171, Cambridge, MA 02139; lpf@uunet.uu.net).

After all, shouldn't software monopoly advocates be the first to receive the "benefits?" ■

Warren organized and chaired the landmark First Conference on Computers, Freedom & Privacy (1991), was one of the first to receive the Electronic Frontier Foundation Pioneer Award (1992), led the recent successful effort to make state legislation and statutes available via the public nets without state charge, and received the James Madison Freedom-of-Information Award from the Society of Professional Journalists—Northern California (1994).

He is also an outside member of Autodesk's board of directors and, among other things, formulated their policy statement strongly opposing the patenting of software.

THE HORSE'S MOUTH

Jim Warren will speak about "Computer Software and Patent Issues" during the April 22 Patent-Office-at-Stanford conference at Stanford Law School; "Electronic Public Access to Government" before San Francisco's Commonwealth Club, May 5 at 5 p.m. (415/597-6700); and about civic networking in Apple's "Building Community Computing Networks," May 4–6 in Cupertino.

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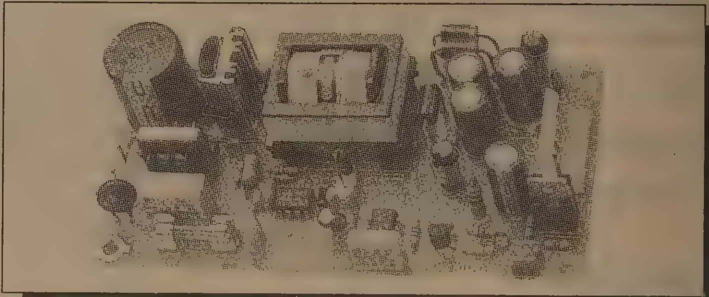

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Letters

More Political Grids On The Info Highway

Mitch Kapor ["From The Frontier," 119N/120S] concludes that government regulation, or threat thereof, will be necessary to "ensure universal access" to a National Information Infrastructure (NII). This assertion is both absurd and, more importantly, dangerous. It is absurd because it disregards history and lacks common sense. It is dangerous because a number of influential techno-types are beginning to try to make this notion a reality.

Mr. Kapor begins by stating that a goverment-built and controlled NII is undesirable, but one completely controlled by "oligopolies of enormous corporations" is equally undesirable. The only remedy, according to Kapor, is governmental regulation and legislation guaranteeing universal access. Unfortunately, Mr. Kapor fails to realize that only government can create and sustain such large oligopolies. Corporations, regardless of size, are always voluntary for an individual unless the corporation is given special treatment by government. Utilities, transportation, cable TV, telephone companies, and railroads have all fallen victim to this notion of "universal access."

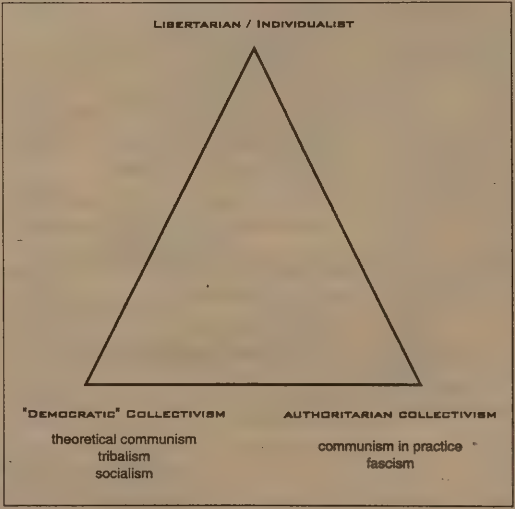
Just what is universal access? Universal access to what? Does this mean a modem in every bedroom? A computer in every pot? Network TV is an excellent example of this ideal gone bad. Instead of paying the market price for a particular bandwidth, television stations keep their licenses for a nominal fee and must meet approval of the FCC. The criterion used, as set forth in the Act of 1927, is the "public interest, convenience, or necessity." In other words, a blank check on power which has guaranteed us the bland programming we have today.

However, the music industry provides a good example of what happens when there is no regulation. The industry is dominated by a few large majors (all of which are owned by companies that have benefited from government regulation). However, because there are no licensing requirements or guarantees of "universal access," thousands of independent labels exist. As a result, virtually any type of music can be purchased for reasonable prices. Software is another good example.

History has taught us that it is very unlikely that a universal system will develop for anything, be it information or healthcare, unless it is forced onto people by government. The media, government policy wonks, and anyone else who can get a sound bit all seem to share this dream of a vast information highway where everyone gets on board. What will be closer to reality will be a number of competing networks, all vying for business and offering different services. Maybe there will be a number of regional systems with a few large nationals like the phone companies. Perhaps large regionals and a number of small independents like supermarkets. No one can be certain, as it will always be changing—but one thing is certain. Any government regulation will result in a bureaucratic nightmare.

I agree with Mitch Kapor's hypothetical libertarian: Government should stay out of it and the "public interest" community should go home. Public interest, espeically in this case, is usually camouflage for collectivist-authoritarians. The only way the public's interest will be harmed is when the government, not the market, creates winners.

Kapor began his article with a modification of Karlgaard's grid. In actuality their grid should be a triangle:


LIBERTARIAN / INDIVIDUALIST
"DEMOCRATIC" COLLECTIVISM
theoretical communism
tribalism
socialism
AUTHORITARIAN COLLECTIVISM
communism in practice
fascism

The axes are not Authoritarian and Anti-Authoritarian, but rather Individualist vs. Collectivist. The lower right and left points represent methods of collectivism. Kapor goes on to explain that his group, EFF, is on the anti-authoritarian side. With policies like these, I think somewhere on the bottom half is more appropriate.

Kincy Clark
Orange

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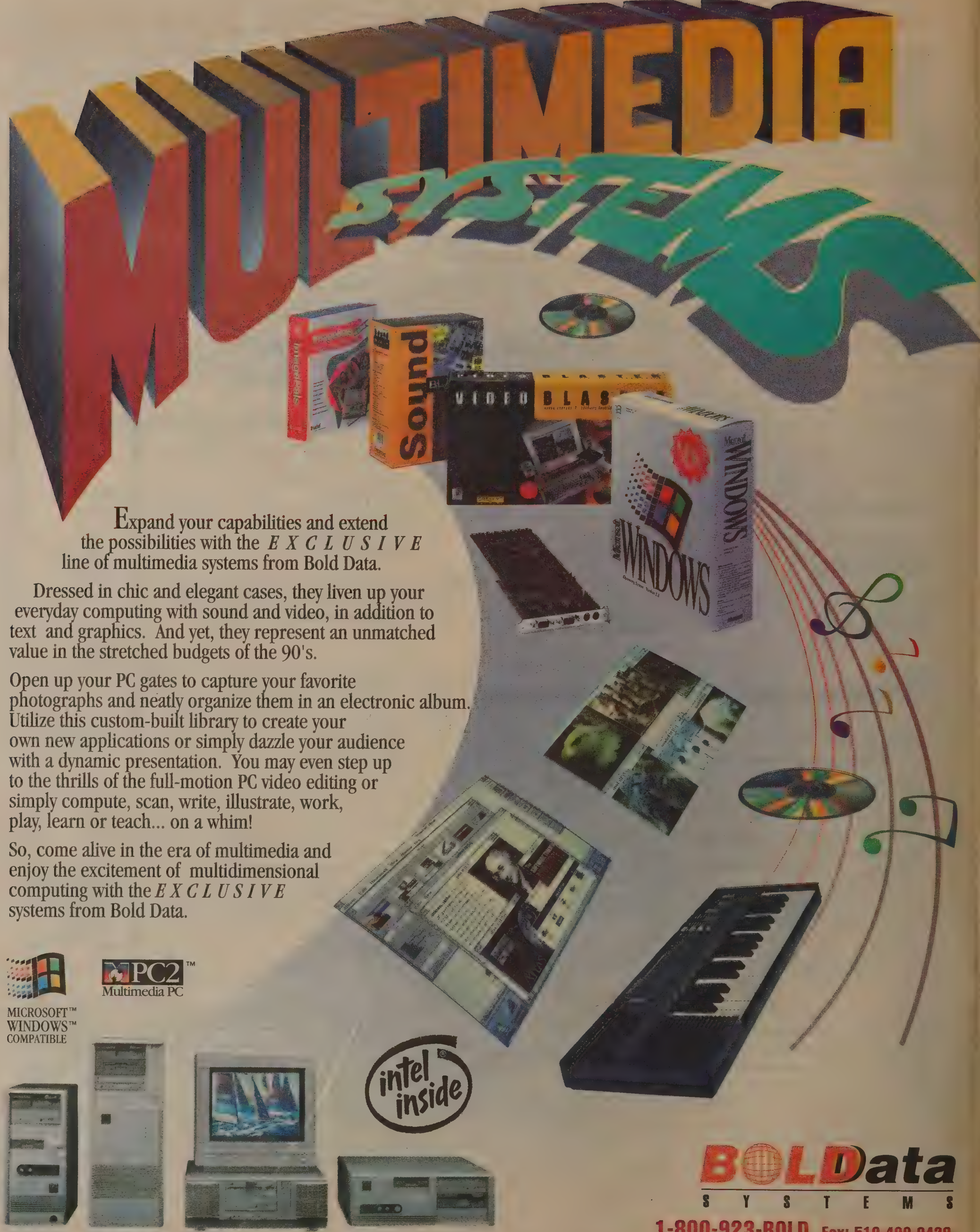

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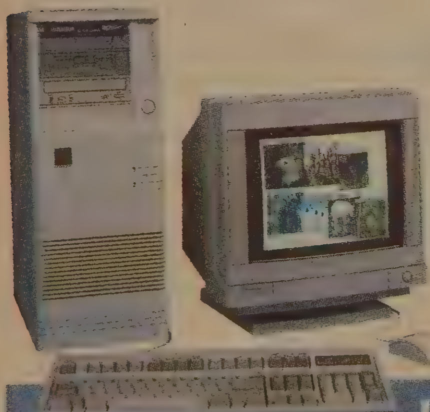

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Step Into The Future

SimCity 2000 Takes The Original SimCity—And You—Into The Next Century

SimCity's sequel is sublime.

BY KEVIN SAVETZ

RESOURCES:

SimCity 2000 (Macintosh), $69.95
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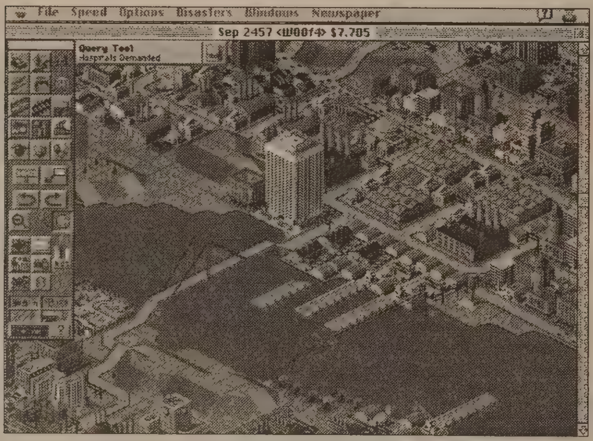
After months of teasing, Maxis has released SimCity 2000, the long-awaited follow-up to SimCity. The original SimCity (now named SimCity Classic) was a fine program, and the first of its kind—focusing on simulating a real-world environment. Since SimCity, Maxis has created a variety of other simulation programs—SimLife, SimAnt, SimEarth, and even SimPower Plant for training real-life energy folks. Maxis has learned what makes a good simulation and an engaging game. It is no surprise that SimCity 2000 is their finest creation.



Those who played the original version of SimCity know the basics: You're a city planner and it's your job to build and sustain a city. Your city is populated by "Sims," finicky citizens who demand the very best from you, their elected official.

Maxis made the game feel incredibly real, especially in comparison to the original SimCity. In SimCity Classic, you could zone commercial, industrial, and residential property, plus a collection of other sites including police forces, fire departments, and stadiums. With SimCity 2000, you can zone "dense" or "light" residential, commercial, and industrial areas—plus you can build seaports, airports, marinas, zoos, stadiums (you choose the sport), schools, colleges, libraries, museums, hospitals, bus stations, and others. You're no longer limited to fixed-size zones—you can create zones, airports, and seaports of any size (limited, of course, by your budget).

How do you keep the Sims happy? Keep taxes low and crime down, create jobs, and educate the citizens. The game offers copious information about how you fare as a city official. You can "query" any piece of property for information—you'll receive pertinent (and sometimes not-so-pertinent) data about the locale. Query a college or school and you are shown its rating as well as number of students and teachers. In residential zones you are told crime and pollution levels. Point to a statue and find out how many pigeons are perched there. Instead of the simple voter opinion poll of SimCity Classic, you can now read the local newspapers to learn what the Sims think of you. (The number of newspapers available depends on the size of your city.)

The pre-made scenarios are so enjoyable that you may never want to create a city from scratch.

The availability of power plants changes depending on the year—you can't build nuclear plants in 1900. Your power choices include coal, solar, wind, microwave, and fusion. Each type of power has its own characteristics, lifespan, and of course, price. Power plants don't last forever so it is important to keep enough money to replace them when they get old. Try an all solar powered city, then watch the solar collectors explode after fifty years. Ouch!

If you didn't save enough money, sell some bonds. Of course, you will have to pay the bonds back, with interest. Fortunately, annual budget time comes around so you can see a projection of income for the following year.

You can view your city at different perspectives and distances, or even underground. You'll need to use all of the angles, too, because SimCity, like Maxis's A-Train before it, uses richly textured 3-D terrain and buildings. The underside of your simulated city is important because you are responsible for maintaining the water system. You can build pipes, desalinization plants, storage towers, treatment facilities, and water pumps. With the added dimension to your city you have to build pipes up and through hills and mountains, as well as over the rivers and through the woods.

Underground is also home to subways, one of several forms of public transit available. Sims are no longer relegated to one form of public transportation. In addition to roads and rail (which require railroad stations), there are highways, subways, and buses.

SimCity 2000 is truly full of surprises—something unexpected crops up every time. If your citizens like your work, they may throw a parade in your honor; if they don't, they may riot. Low populations mean abandoned buildings. Heavily populated futuristic cities can have "arcologies"—huge domed cities-within-a-building.

You can start by building your city on bare land, or begin with one of several scenarios (such as Oakland, Charleston, and Hollywood) in which you must overcome a problem or disaster (such as flies, flooding, or a space alien attack). The pre-made scenarios are so enjoyable that you may never want to create a city from scratch.

SimCity 2000 is almost perfect. Unfortunately, the game only runs on 256 colors or shades of grey. (It requires a Mac LC or faster running System 7 or later; a PC version is also available.) The simulation runs rather quickly, even on huge cities, but scrolling around the city, zooming, and rotating the view can be slow. SimCity 2000 also crashed inexplicably until we booted without our usual cadre of system extensions.

SimCity 2000 is definitely Maxis's most inspired work to date. Loyal SimCity Classic enthusiasts will adore 2000's new features, tools, and wit. Those new to city management, as well as Classic gurus, will find hours of pleasure in one of the finest Macintosh games ever. ■

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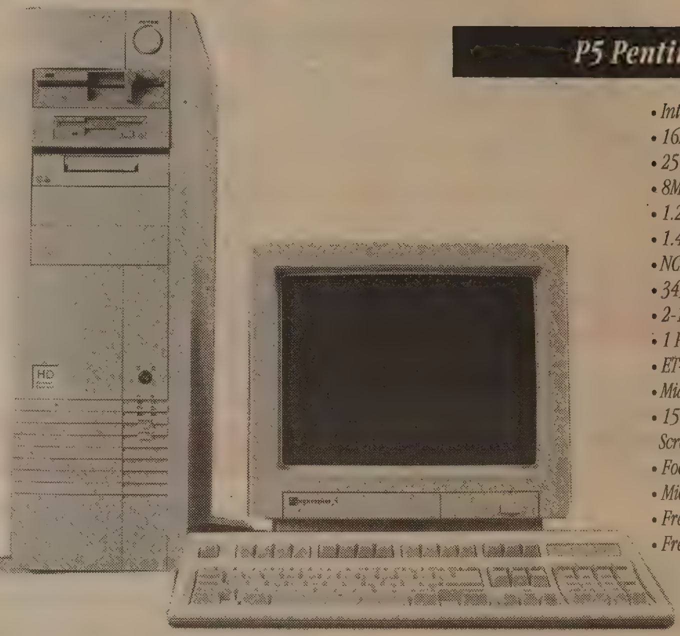

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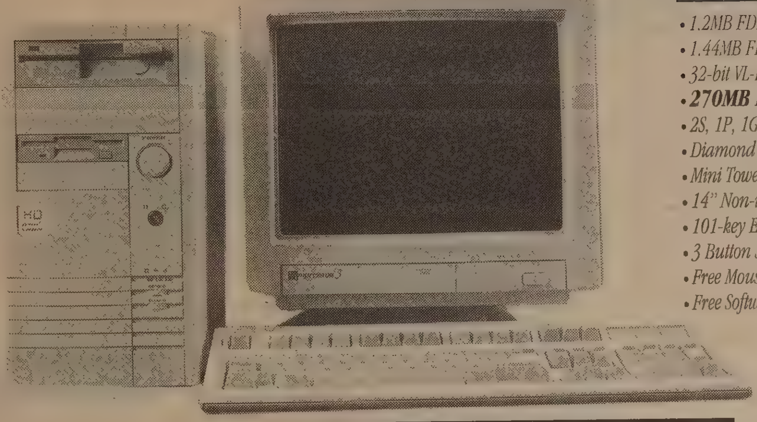

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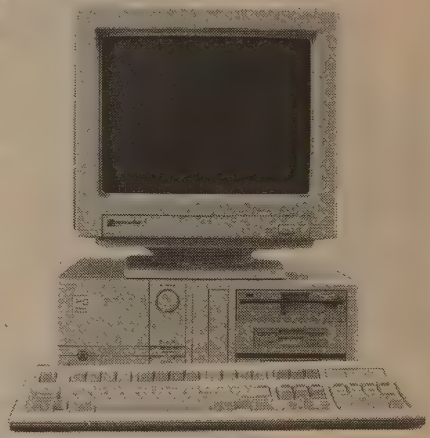

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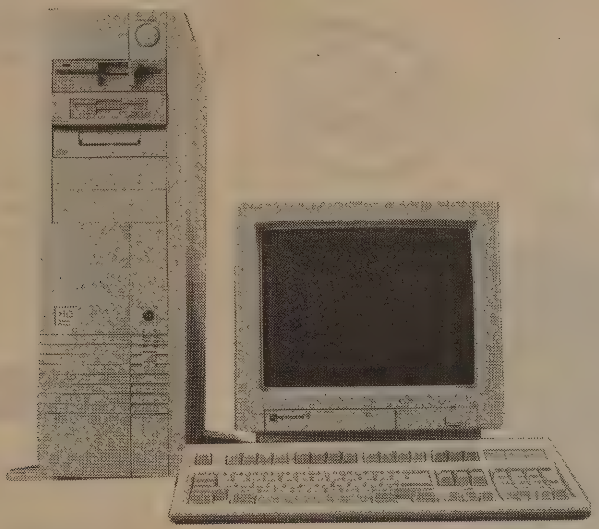
NETWORK SYSTEMS

"We Stand Behind Our Technology, Quality and Service"



Novell Labs Tested & Approved

Ethernet Adapters

- *DANPEX*

EN-2000B 16Bit BNC	**$65**
EN-2000BT 16Bit Combo	**$85**
EN-2000PB 16Bit Soft Set BNC	**$60**
EN-2000PT 16Bit Soft Set 10BT	**$60**
EN-2000P3 16Bit Soft Set Combo	**$75**
EN-6000B Pocket Lan BNC	**$137**
EN-6000T Pocket Lan 10BT	**$140**
EN-4001 4Port 10BT Hub Card	**$150**
EN-800A 8Port 10BT Hub	**$215**
EN-1212A 12Port 10BT Hub	**$485**

- *Accesories*

RG58 Coax Cable BNC 10'	**$8.00**
RG58 Coax Cable BNC 25'	**$10.00**
RG58 Coax Cable BNC 50'	**$13.00**
RG58 Coax Cable BNC 100'	**$25.00**
BNC Straight Adapter F-F	**$1.80**
BNC T Adapter F-M-F	**$3.80**
BNC Terminator 50 OHM	**$2.20**
BNC Connector Crimp on RG58	**$1.80**
BNC Connector Mold	**$2.00**
Gender Change DB25 F/F, M/M	**$4.00**
Gender Change Cent .36 F/F, M/M	**$7.00**
Gender Change DB25 to Cent .36	**$5.00**
Gender Change DB9 to DB25	**$4.00**
Gender Change DB9 to Din6	**$5.00**
RG58 A/U Coax Cable 1000	**$125.00**
RJ45 8 Twist Pair Cable 1000'	**$110.00**
RJ45 8 Twist Pair Cable 10'	**$3.50**
RJ45 8 Twist Pair Cable 25'	**$4.50**
RJ45 8 Twist Pair Cable 50'	**$9.50**

- *Microdyde/Novell*

NE-2000 Plus 16bit	**$115**
NE-2000T Plus	**$115**
NE-3200 EISA 32bit Coax/TP	**$539**
NE-2000 Plus 3	**$129**

Ethernet Adapters

- *Compatible*

NE-1000 8bit Coax	**$59**
NE-2000 16bit Coax/TP	**$60**
NE-2000 16bit Combo	**$75**
NE-2000 16bit 5 pack	**$235**
EP-888A Pocket Ethernet BNC + 10BT	**$145**
EP-808A 8Port Ethernet HUB	**$199**
EC-812 12Port Ethernet HUB	**$449**
EE-840 32Bit EISA Ethernet	**$289**

- *Intel*

Etherexpress 16 16bit 5pack/20pack	**$575/1995**
Intel 16bit Ethernet Combo PCLA 8100	**$129**
Intel 16bit Ethernet BNC PCLA 8110	**$115**
Intel 16bit Ethernet 10BT PCLA 8120	**$115**
Intel 16bit Ethernet Combo PCLA 8105/Flash	**$159**

- *3COM*

3C503 Etherlink II 16 Coax/TP	**$175**
3C503 Etherlink II 16 5pack	**$785**
3C507 Etherlink II 16 Coax/TP	**$295**
3C509 Etherlink III Coax/TP	**$145**
3C509 Etherlink III 5pack	**$645**

- *SMC*

Ether card plus elite 16 Coax/TP	**$119**
Elite ultra 16bit Coax/TP	**$115**
Elite ultra 16bit 6pack/24pack	**$675/2375**
SMC Ultra 16 Bit Ethernet Combo	**$135**

- *DLINK*

DE-600 TP Pocket Ethernet 10BT	**$199**
DE-205 TP 16Bit Ethernet 4 Port 10BT	**$290**

• *4 Port 10 Base-T Hub Card*	**$150**
• *8 Port 10 Base-T Hub*	**$215**
• *12 Port 10 Base-T Hub*	**$485**

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MULTIMEDIA

9 CD-ROM Package Options for You to Convert Your Computer Into The Multimedia World!!

Free installation with Purchase of New System

- *NEC triple speed internal CD ROM*
- *Pro Audio Studio 16*
- *Microsoft Works MPC*
- *Microsoft Bookshelf MPC*
- *Compton's Encyclopedia*

$796

- *Toshiba double speed internal CD ROM*
- *Pro Audio Spectrum 16*
- *Microsoft Works MPC*
- *Microsoft Bookshelf MPC*
- *CD game*

$569

- *Panasonic double speed internal CD ROM*
- *Gallant 5000 16 bit sterio sound card*
- *Speaker and Microphone*
- *Microsoft Works MPC*
- *Microsoft Bookshelf MPC*
- *Toolworks Encyclopedia*
- *King's Quest*

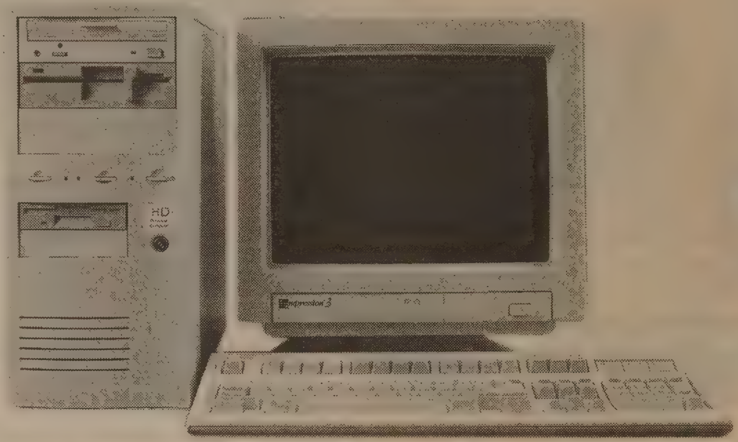
$425

- *Sony Double Speed CD-ROM*
- *16 Bit Mediavision Spectrum Sound Card*
- *Stereo Speaker*
- *New Grolier Encyclopedia*
- *Animals*
- *Mavis*
- *Chessmaster*
- *Wrold Atlas*
- *U.S. Atlas*

$395

- *Internal Single Speed CD ROM*
- *Gallant 4000 sound card/Interface*
- *Speaker and Microphone*
- *U.S. Atlas*
- *Playing with Language English*
- *CD game package II*
- *Camera San Diego*

$299



Multimedia System Best Buy!

- ***Intel 486 DX33 Processor***
- ***ZIF Socket 128K Cache***
- ***4MB RAM***
- ***1.44 MB FDD***
- ***270 MB IDE HDD***
- ***32Bit VL-B Graphic Accelerator Card/1MB***
- ***2F/2H IDE Disk Controller***
- ***2S.1P.1G Ports***
- ***Internal Samsung CD ROM (W/Ext Case)***
- ***16 Bit Stereo Sound Card (W/Ext Cable)***
- ***60W Stereo Speaker***
- ***CD: Groliers Encyclopedia***
- ***CD: Authorware star***
- ***CD: Multimedia world Atlas***
- ***CD: Music Rack***
- ***CD: Great cities of the world Vol.1***
- ***Mini-Tower Case w/ 200W Power Supply***
- ***14" Non-interlaced Monitor, .28 dpi***
- ***101-key Enhanced Keyboard***
- ***3 Button Serial Mouse***
- ***Free Mouse Pad***
- ***Free Software Option***

$1499

Discovery CD

- *Entry Level Multimedia Upgrade Kit.*
- *Sound Blaster card, new dual speed drive Photo-CD compatible*
- *Lemmings, Animals!, Software Toolworks' Encyclopedia Sound Blaster CT-38 Shielded Stereo Speakers.*

$425

Creative Lab

Edutainment CD

- *Mid-Level Multimedia Upgrade Kit.*
- *Sound Blaster 16, new dual speed drive, Photo-CD compatible*
- *Sound Blaster CT-38 Shielded speakers, Microphone, Software Toolworks' Encyclopedia, Animals, Secret Weapons of the Luftwaffe, Monkey Island, Loom, Sherlock Holmes Vol. II, Carmen San Diego and Grandma and me.*

$469

Mitac

Mitac Deluxe Multimedia Kit

- *Mitsumi Double-Speed CD-ROM Drive*
- *16-Bit Sound card*
- *A Pair of Amplified Stereo Speakers with power boosters.*
- *Five CD ROM software titles*

$375

Orchestrator

- *16 Bit CD Quality and Stereo Surround Sound*
- *Power Packed Sound and MIDI Software Package for DOS and Windows*
- *Sony Double Speed CD ROM*
- *6 CD Titles Including:*
  - *1. **Asymetrix's** undiluted, full blown Multimedia Presentation Software Double, **Compel** and **MediaBlitz**!*
  - *2. Together with Compton's Encyclopedia, Mayo Clinic and Two Exciting Pieces of 3-D Animated Game Software for all Ages.*

$399

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MULTIMEDIA

We Offer Variety of Choice Multimedia System for You to get into The Multimedia World!

CD-ROM Drives

TOSHIBA/XM3401B
- SCSI CD-ROM, 200ms, 330KB/sec
- Multi-Spin/Multi-Speed
- 256K Cache Buffer
- Kodak Photo CD
- Caddy included

Internal	**$339**
External	**$389**

PANASONIC/CR562 CD ROM & Card
- Includes Audio Card & Controller
- 320ms/300KB/sec
- 64K Cache
- Double Speed

$195

PANASONIC/CR523 CD ROM & Card
- Includes Audio Card & cables
- 380ms
- 64K Cache

$145

SONY/New Multi Speed 300KB/Sec
- Controller Card
- Cables and Software

$199

SONY/561 SCSI CD ROM
- Double Speed
- 285 ms/300kb/Sec
- 256K Cache

$365

NEC/New Triple Speed:
- 450Kb/Sec/190ms

Interna	**$495**

- 450Kb/Sec/190ms

External	**$565**

TEAC/CD-50 SCSI CD ROM	**$259**
TEXEL 3028 SCSI CD ROM 240ms	**$275**
DM-5028 External w/Caddy	**$365**

More Than 500 CD Titles are Available!!!

Sound Cards

Mitac	
16 Bit Sound Card w/Speaker	**$129**
Genoa	
8 Bit Sound Card	**$69**
Creative Labs	
Sound Blaster Pro Deluxe	**$106**
Sound Blaster 16 Basic	**$126**
Sound Blaster 16 SCSI 2/with ASP	**$182/205**
Sound Blaster 16 MultiCD/with ASP	**$165/195**
Video Blaster	**$305**
Wave Blaster	**$179**
Media Vision	
Pro Audio Spectrum 16	**$123**
Pro Audio Studio 16	**$153**
Gallant	
MIDI Kit	**$39**
Gallant 4000 w/Interface, Speaker & Microphone	**$79**
Gallant 5000 16 Bit Stereo w/Interface, Speaker & Microphone	**$109**
Gallant 6000 16 Bit/ASP Speaker & Microphone	**$159**
Logitech	
Logitech SoundMan 16, 16-bit Sound Card	**$98**

TV Cards

Sigma Reel Magic MPEG Board	**$405**
TVator Pro, IBM PC to TV Convertor	**$249**
TVator Pro, Megavision	**$319**

Speakers

Gallant GSP 1000 80W Speaker	**$85**
Gallant GSP 330 40W Speaker	**$55**

Multimedia has definitely landed! If you're shopping for fully featured, high-performance Multimedia Systems... you've come to the right place. Capture new levels of creativity, exciting presentations, not to mention education, entertainment and video, at home or in the office.

The powerful, new Intel 486 PCI Multimedia system from HD Computer is available in four different configurations. HD's new Multimedia system offers the ultimate in performance and capability with an ability to expand. Upgradeable to Pentium Overdrive, this ready-to-go system comes packed with an impressive list of functions and features.

HD Computer brings Multimedia to your fingertips.

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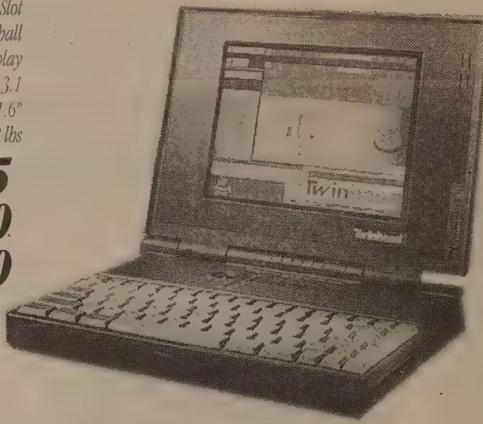
NOTEBOOK

Twinhead Powerful Slimnote

- Intel SL Enhanced Processor
- 4MB RAM Expandable to 20MB
- 1.44MB Built-in Floppy Disk Drive
- 84 Keys Keyboard
- PCMCIA Type II Slot
- Built-in Trackball
- 10" VGA/Mono Display
- MS DOS 6.2, MS Windows 3.1
- Physical Dimensions 8.5" x 11" x 1.6"
- Weight with Battery 5.8 lbs

486DX-33 w/130MB HD	**$1945**
486DX-33 w/200MB HD	**$2130**
486DX2-66 w/200MB HD	**$2590**



- Intel SL Enhanced Processor
- 4MB RAM Expandable to 20MB
- 1.44MB Built-in Floppy Disk Drive
- 84 Keys Keyboard
- 256 Color Display/512K RAM
- PCMCIA Type II Slot
- Built-in Trackball
- MS DOS 6.2, MS Windows 3.1
- Physical Dimensions 8.5" x 11" x 1.8"
- Weight with Battery 6.3 lbs

486DX-33 w/130MB HD Dual Scan Color	**$2695**
486DX2-66 w/200MB HD Dual Scan Color	**$2845**

Twinhead Brilliant Color Notebook

486DX-33 w/130MB HD Active Color	**$3555**
486DX-33 w/200MB HD Active Color	**$3695**
486DX2-66 w/200MB HD Active Color	**$4155**

MTC-4020 Color Notebook

- Intel 486SX-33 CPU
- 4MB RAM Expandable to 20MB
- 130MB IDE Hard Disk
- One Serial Port, One Keyboard/Mouse Port
- One External VGA Connector
- One PS II Keyboard/Mouse Connector
- 85 Keys Keyboard with Inverted "T" cursor Keys
- Build-in 1.44 MB Floppy Disk Drive
- Built-in 16mm Trackball
- Preloaded with Microsoft DOS and Windows
- 11" (W) x 8.5" (D) x 1.9" (H)/5.5lbs

$1815

MNB-4010 Subnote

- Intel 486SX-25 CPU
- 4MB RAM Expandable to 20MB
- 2 PCMCIA Level II or Single Level III Slots
- Two Serial, One Parallel Connector
- One External VGA Connector
- One PS II Keyboard/Mouse connector
- 79 Keys Keyboard with Inverted "T" cursor Keys
- Built-in 16mm Trackball
- Windows Sound System Compatible Sound Option
- Preloaded with Microsoft DOS and Windows
- Physical Dimensions 10.5" x 7.8" x 1.5"
- Weight : 4lbs

MNB 80MB HD	**$1375**
MNB 130MB HD	**$1435**

• **Pocket Lan Coax (for notebook)**	**$137**
• **Pocket Lan 10 Base-T (for notebook)**	**$140**
• **14400 Fax/Moden Mini-Pocket (for notebook)**	**$229**

Twinhead 4 Pounds Powerful Subnote

- 4MB RAM Expandable to 8MB
- 1.44MB External Floppy Disk Drive
- 8" Side lit VGA display, 64 shades
- 85MB IDE Hard Disk
- 79 Keys Keyboard
- 64 Gray Shades VGA Display
- PCMCIA Type II Slot
- Built-in Trackball
- MS DOS 6.2, MS Windows 3.1
- Physical Dimensions 7.1" x 10" x 1.6"
- Weight with Battery 4 lbs

486SLC-33 Only	**$1495**

Accesories

• Mini-Pocket 14.4 Fax Modem	**$229**
• Dlink DE-600TP Pocket Ethernet	**$199**
• Dlink EN-6000B Pocket Lan BNC	**$137**
• Danpex EN-6000T Pocket Lan 10BT	**$140**
• EP 888A Pocket Lan BNC + 10BT	**$145**

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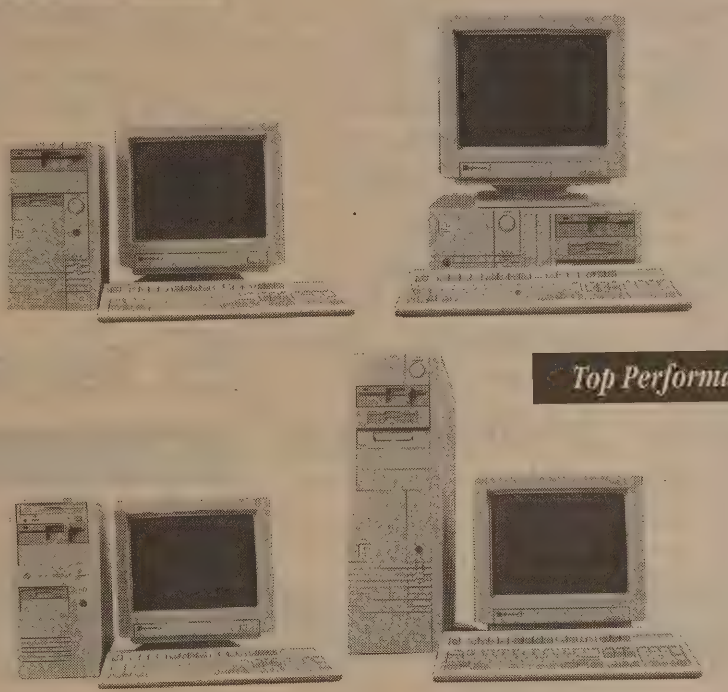
GENERAL/BEST BUY SYSTEM

ISA-486 Windows Accelerator System

- Intel 486 Processor
- 128KB Cache (Max. 256KB)
- 4MB RAM (Max. 32MB)
- 1.2MB FDD
- 1.44MB FDD
- 130MB IDE HDD
- 2H/2F IDE Disk Controller
- 2S, 1P, 1G Ports
- 16-bit Windows Accelerator Card/1MB
- Mini-Tower Case w/ 200W Power Supply
- 14" Non-interlaced Monitor, .28 dpi
- 101-key Enhanced Keyboard
- 3 Button Serial Mouse
- Free Mouse Pad
- Free Software Option

SX-25	$1035
SX-33	$1085
DX-33	$1225
DX-50	$1325
DX2-66	$1425



Top Performance EISA/VESA System

- Intel DX-486 Processor
- ZIF Socket OverDrive Ready
- 8KB Internal Cache
- 256KB External Cache
- 4MB RAM (Max. 128MB)
- 1.2MB FDD
- 1.44MB FDD
- 32-bit EISA SCSI II Controller
- 2 16550 UART High Speed Serial Port
- 1 Parallel Port
- 345MB SCSI HDD
- Tseng Lab ET-4000 W32 VL-B Graphic Accelerator Card/1MB
- Mid Tower Case w/ 230W Power Supply
- 14" ViewSonic 6E Non-interlaced Monitor
- 101-key Keytronic Keyboard
- 3 Button Serial Mouse
- Free Mouse Pad
- Free Software Option

DX-33	$1995
DX-50	$2110
DX2-66	$2195

HD 386 Systems Below $900

- 4MB RAM (Max. 32MB)
- 1.44MB FDD
- 130MB IDE HDD
- 2H/2F IDE Disk Controller
- 2S, 1P, 1G Ports
- 16-bit SVGA Card/1MB
- Mini Tower Case w/ 200W Power Supply
- 14" SVGA Monitor, .39 dpi
- 101-key Enhanced Keyboard
- 3 Button Serial Mouse
- Free Mouse Pad

386SX-33	$825
386DX-33/64K Cache	$855
386DX-40/64K Cache	$855

With Purchase of New System only

• M.S. DOS 6.2	$45
• M.S. Windows 3.11	$48
• M.S. Windows for Workgroups ADD on 3.11	$58

Free Software Option:

- PFS: Windows Works
- PFS: Publisher
- PFS: Prospect
- PFS: First Choice
- CD Title: Toolworks Encyclopedia

HD Computer continues to offer leading, high-performance system configurations for any application. Custom configuration. Lifetime technical support. 30-day money back guarantee. No other Bay Area system integration house can boast this type of service and support.

HD's new EISA/VESA systems, 386 systems and Windows Accelerator systems are only a few of the many system configurations now offered by HD Computer. Whether for business or at home, HD will custom build the computer systems to your specifications.

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Hard Drives

CONNER

IDE Hard Disk

250MB, IDE, 14ms	**$229**
340MB, IDE, 13ms	**$265**
540MB, IDE, 12ms	**$469**

SCSI Hard Disk

Capacity	M/N	Cache	Speed	Size	Internal	External
170MB	CP30170	64K	17ms	3.5x1	$225	$349
212MB	CP30200	256K	12ms	3.5x1	$285	$399
540MB	CP30540	256K	12ms	3.5x1	$525	$639
1.0GB	CPF1060S	256K	10ms	3.5x1	$995	$1119

WESTERN DIGITAL

250MB, IDE, 13ms, 2 Yr. Warranty	$235
340MB, IDE, 12ms, 3 Yr. Warranty	$285
420MB, IDE, 13ms, 3 Yr. Warranty	$365
540MB, IDE, 12ms, 3 Yr. Warranty	$479

Maxtor

IDE

131MB, IDE, 14ms, 1 Yr. Warranty	**$179**
245MB, IDE, 15ms, 1 Yr. Warranty	**$239**
345MB, IDE, 14ms, 2 Yr. Warranty	**$275**
540MB, IDE, 8.5ms, 256K Cache, 2 Yr. Warranty	**$479**

SCSI

245MB, SCSI, 15ms, 2 Yr. Warranty	**$245**
345MB, SCSI, 14ms, 2 Yr. Warranty	**$345**
540MB, SCSI, 8.5ms, 256K Cache, 2 Yr. Warranty	**$569**
1.2GB, SCSI, 8.5ms, 256K Cache, 2 Yr. Warranty	**$1299**

Quantum

540 MB IDE **$469**
128K Cache, 3.5X1"

270 MB IDE **$249**
128K Cache, 3.5X1"

1.2GB SCSI **$969**
512K Cache, 10ms

IDE

Capacity	M/N	Cache	Speed	Size	Price
170MB	ELS170A	32K	17ms	3.5x1	$179
240MB	LPS240A	256K	Fast	3.5x1	$229
270MB	LPS270A	128K	Fast	3.5x1	$249
525MB	LPS525AT	512K	Fast	3.5x1	$499
540MB	LPS540AT	128K	Fast	3.5x1	$469

SCSI

Capacity	M/N	Cache	Speed	Size	Internal	External
170MB	ELS170S	32K	17ms	3.5x1	$185	$325
240MB	LPS240S	256K	Fast	3.5x1	$245	$355
270MB	LPS270S	128K	12ms	3.5x1	$265	$375
525MB	LPS525	512K	10ms	3.5x1	$565	$665
700MB	PD700	512K	10ms	3.5	$735	$859
1.0GB	PD1050S	512K	10ms	3.5	$895	$979
1.2GB	PD1225S	512K	10ms	3.5	$969	$1069
1.8GB	PD1800S	512K	10ms	3.5	$1169	$1269

Seagate

263MB **$229**

Capacity	M/N	Cache	Speed	Sixe	Int.	Ext.
341MB	ST3390N	256K	12ms	3.5x1	$399	$529
456MB	ST3550N	256K	12ms	3.5x1	$559	$679
525MB	ST3600N	256K	10.5ms	3.5x1	$679	$799
1.05GB	ST11200N	256K	10.5ms	3.5	$995	$1125
1.0GB	ST31200N	256K	9ms	3.5x1	$1089	$1199
1.4GB	ST41651N	256K	15ms	FH	$1099	$1299
1.9GB	ST42100N	256K	13ms	FH	$1489	$1689
2.1GB	ST42400N	256K	11ms	FH	$1749	$1949
2.1GB	ST12400N	256K	9ms	3.5	$1599	$1729
2.9GB	ST43400N	512K	10ms	FH	$2299	$2499
2.9GB	ST43401N	512K	Fast Wide SCSI II	5.25	$2499	$2895

FUJITSU

• 128MB Removable Optical Diskette • Rewritable • 3.5" Diskette Size of Floppy • Unlimited Storage • Ideal for Data Mobility • Fast Access time and Data Transfer. • ISO Standard • 128MB Rewritable Optical SCSI Drive

Internal Drive **$789**
- Bare Optical Drive
- Low Profile, Only 1"
- 256K Cache
- 2511A
- Fast 30ms Seek Time
- 3600RPM

External Drive **$899**
- External Optical Drive
- 2511A
- Includes 1 cartridge
- Formatting Software for MAC (Free upon request)

520MB SCSI 3.5" **$479**
- 3.5" HH Drive
- 12 ms Seek Time
- 240K Read/Write Cache (SCSI)
- 5 Yr. Warranty

SCSI

Capacity	M/N	Cache	Speed	Size	Internal	External
520MB	M2624FA	240K	12ms	3.5	$479	$575
1.0GB	M2694ESA	256K	10ms	3.5	$899	$999
2.0GB	M2654SA	256K	12ms	FH	$1599	$1699

IDE

Capacity	M/N	Cache	Speed	Size	Price
520MB	M2624T	64K	12ms	3.5	$469

MICROPOLIS

MC2210S
1.0GB Fast SCSI-II 3.5" 10ms Seek Time 5400 RPM **$825**

IDE

Capacity	Model	RPM	Speed	Size	Internal
1.0GB	MC2210A	5400	10ms	3.5	$825
1.75GB	MC2217A	5400	10ms	3.5	$1295

SCSI

1,0GB	MC2210	5400	10ms	3.5	$825	$965
1.0GB	MC2210AV	Audio/Visual			$1099	$1229
1.4GB	MC1908	5400	11ms	FH	$1349	$1409
1.75GB	MC2217	5400	10ms	3.5	$1295	$1425
1.75GB	MC2217AV	Audio/Visual			$1399	$1499
1.8GB	MC1548	3600	14ms	FH	$1499	$1699
2.0GB	MC1926	5400	11ms	FH	$1699	$1899
3.0GB	MC1936	5400	11ms	FH	$2499	$2699

SyQuest

105MB Internal	**105MB External**
$339	$449

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3.5" DS/HD Disk 25 pack *$9.99*

Motherboards

MODEL	TYPE	DESCRIPTION	PRICE W/O CPU
P5-MPS	Pentium PCI	3 PCI, 4 ISA Slots, Flash EPROM BIOS, 256K Cache up to 512K, 0MB RAM up to 192MB	$465
S1441	Pentium Local Bus	3 VESA, 8 ISA Slots, 256K Cache up to 512K, 0MB RAM up to 128MB, 3 Bus Master	$485
486SP3	486PCI Local Bus	3 PCI, 4 ISA Slots, ZIF Socket, 256K Cache up to 512K, 0MB RAM up to 128MB, Built-in PCI SCSI Controller, Built-in IDE Disk Controller, Built-in 2 Serial, 1 Parallel Ports	$335
486SVI	EISA/VESA	8 EISA, 2 VESA Slots, Zif Socket, AMI BIOS, 256K Cache up to 1MB, 0MB up to 256MB	$335
S1437	EISA/VESA	7 EISA, 1 VESA Slots, SIS Chipset, AWARD BIOS, 256K Cache, 0MB up to 128MB	$325
VL-SV2	VESA Local Bus	7 ISA, 2 VESA Slots, SIS Chipset, ZIF Socket, 128K Cache up to 256K, 0MB RAM up to 32MB	$145
VL-CV2	VESA Local Bus	8 ISA, 2VESA Slots, Contaq-A Chipset, ZIF Socket, 128K Cache up to 256K, 0MB RAM up to 32MB	$145
CLT486VLS2	VESA Local Bus	Made in USA, 8 ISA, 2 VESA Slots, Contaq-A Chipset, ZIF Socket, 128K Cache up to 256K, 0MB RAM up to 128MB	$155

386SX-33/CPU	$105
386DX-40/64K/CPU	$135
386DX/64K (Motherboard Only)	$85

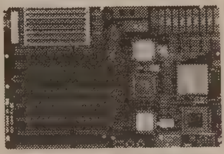
Micronics

VESA Local Bus/256K/DX-33 CPU	$660
VESA Local Bus/256K/DX2-66 CPU	$875
JX30 VESA Local Bus/256K/DX2-66 CPU	$925
EISA VLB/256K/DX-33 CPU	$845
EISA VLB/256K/DX2-66 CPU	$1060

AMI Motherboard

Enterprise III EISA/VESA /256K/486DX-33 CPU	$865
Enterprise III EISA/VESA/256K/486DX2-66 CPU	$1089
Enterprise IV EISA/VESA /256K/486DX-33 CPU	$745
Enterprise IV EISA/VESA/256K/486DX2-66 CPU	$990
Super Voyager VL-B/256K/486DX-33 CPU	$595
Super Voyager VL-B/256K/486DX2-66 CPU	$855

GREEN 486 VESA Local Bus Motherboard



SIS Chipset, 256K Cache use 72-pin SIMM, Max. 64MB	$195
Contaq Chipset, 256K Cache use 30-pin SIMM, Max. 32MB	$175

Modems

Zoltrix 2400 Modem	$40
Zoltrix 9600/2400 Fax Modem	$59
Zoltrix 14400 Fax Modem	$129
US Robotics 14400 (Int)	$145
US Robotics (Ext)	$163
DSI 14.4K Internal Fax Modem	$129
DSM 1914XE Turbo External 19.6 Modem, 14.4K S/R Fax	$249
DSM 1414XB Internal w/ UART 16550 14.4K Modem, 14.4 S/R Fax	$139
DSM 1414XA External, Rockwell Technologies 14.4K Modem, 14.4 S/R Fax	$169
DSM 1414XP Mini-Pocket, 14.4K Modem, 14.4 S/R Fax	$229
DSM 2442XE External w/ Data-Tack Switch 2400 Modem, 9600 S/R Fax	$99
Hayes-Opt 144-F External Fax Modem	$239
Hayes-Opt 1441-F Internal Fax Modem	$219
Hayes-A144E-F Accura External Fax Modem	$385
Hayes-A144I-F Internal Fax Modem	$369
Intel 14.4K External Fax Modem	$185
Intel 14.4K Internal Fax Modem	$165
Mitac 14.4K External Fax Modem	$149
Mitac 14.4K Internal Fax Modem	$129
Tyin 2000 Fax Modem Audio Card	$209

Tape Back-Up

VIPER (SCSI)

2150S, 250MB VIPER, 6MB/Min		
	Internal	$339
	External	$449
2525S, 525MB VIPER, 6MB/Min		
	Internal	$499
	External	$599

ARCHIVE (SCSI)

(For IBM Compatibles, SUN, MAC & NeXT) Anaconda, 36MB, Min, SCSI-2, 1/4"" Tape Unit

1.3GB 2750	Internal	$799
	External	$899
2.0GB 2800	Internal	$999
	External	$1099

SUMMIT

With Central Point Backup Software, Runs off Floppy Port

120MB	Internal SE-120	$129
250MB	Internal SE-250	$159

COLORADO MEMORY SYSTEMS

Uses 2120 Tapes, Runs off Floppy Port

120MB	Internal DJ10 Jumbo 120	$99
250MB	Internal DJ20 Jumbo 250	$159

TRAKKER

Parallel Printer Port External Tape Backup Systems, Runs off Parallel Printer Port

120MB	External Trakker 120	$289
250MB	External Trakker 250	$329

WANGDAT (SCSI)

SCSI 4mm DAT

2.0GB (3100DAT)	Internal	$999
	External	$1099
4-8GB (3200DAT)	Internal	$1099
	External	$1199

MICROSOLUTIONS

Parallel Port	250MB External Tape Back-up	$359
Double Speed Parallel Port	External CD-ROM Backpack	$395

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Video Cards

3.5" DS/HD Disk 25 pack $9.99

ATi TECHNOLOGIES INC

Graphic Ultra+Windows Accelerator	
Graphic Ultra Pro	
Accelerated 1024x768 at 256 Colors - up to 74Hz. Non-interlaced.	
1MB VRAM	$275
2MB VRAM	$365
with ATi Bus Mouse	add $25
Graphics UltraPro 2MB EISA	$395
Graphics Ultra Pro VLB Mach 32	
1MB VRAM	$295
2MB VRAM	$395
MACH32 - 16.7 Million Colors	
1MB DRAM	$295
2MB DRAM	$395
with ATi Bus Mouse	add $25
MACH32 PCI 2MB	$445

DIAMOND Computer Systems, Inc.

Diamond	
Stealth Pro 1MB/2MB ISA	$245/345
Stealth Pro 1MB/2MB VLB	$255/335
SpeedStar Pro VESA or ISA	$125
Stealth 24 VESA or ISA 1280x1024	$155
Viper VLB 2MB VRAM Accelerator	$365
Viper PCI 2MB VRAM Accelerator	$435
Stealth PCI 2MB	$245

ORCHID

ORCHID	
Celsius VLB 1MB VRAM/2MB	$225/285
Fahrenheit 1280 Plus 1MB	$149
Fahrenheit 1280 Plus VLB 1M/2M	$169/199
Fahrenheit VA or VA/VLB 1M/2M	$175/205
Kelvin PCI 1MB	$179

SPiDER Graphics, Inc.

Spider 32VLB	
VESA Local Bus, 1280x1024 in 256 colors, 1024x768 @ 72Hz	
1MB DRAM	$95
2MB DRAM	$135
Spider 32VLB Plus	
VESA Local Bus, 1280x1024 in 256 colors, 1024x768 @ 72 Hz, 30% Faster Than VLB	
1MB DRAM	$115
2MB DRAM	$165
Black Widow	
VLB, IIT AGX-015, XGA Graphics Engine, VRAM 32-bit OS/2 2.1 Drive Support, up to 100Hz Refresh Rate	
1MB DRAM	$179
2MB DRAM	$239

CARDEXPERT

ET-4000	1MB ISA	$85
ET-4000W32 VL-B	1MB	$125
ET-4000W32i VL-B	2MB	$185
ET-4000 W32P PCI	1MB/2MB	$195/$225
ET-4000	1MB ISA True Color	$95
Cirrus Logic 5420	1MB ISA	$59
Cirrus Logic 5426 VLB	1MB	$95
Cirrus Logic 5428 VLB	1MB	$99
UMC VLB VGA	1MB Built-in IDE/2S1P1G	$115
WD Chipset ISA	1MB	$95

AMI

Fast View VLB	2MB RAM, Windows Accelerator Card	$359

matrox VIDEO PRODUCTS GROUP

MGA-ULT/2/A	2MB ISA/VLB	$499
MGA-IMP/3/A	3MB ISA	$739
MGA-IMP/3/V	3MB VLB	$739
MGA-PRO/4.5/V	4.5MB VLB	$1595
MGA-PRO/4.5Z/V	Z-Buffer VLB	$1895
MGA-PCI/2	2MB PCI	$459
MGA-PCI/2+	Upgradeable to 4MB	$539

9GXI L-25F	3MB ISA	$1259
9GXE L-10	1MB ISA	$249
9GXE L-10	1MB VLB	$249
9GXE L-11	2MB ISA	$345
9GXE L-11	2MB VLB	$345
9GXE L-12	3MB ISA	$425
9GXE L-12	3MB VLB	$425
9GXE L-14	4MB ISA	$595
9GXE L-16		$895

Hercules

HG720	Graphite VL Pro 2MB	$409
HG310	Graphite Pro 1MB ISA	$279
HG610	Graphite Pro 1MB VLB	$289

DYNAMITE

D301 PRO	1MB ISA	$189
D302 PRO	2MB ISA	$259
D601 PRO	1MB VLB	$189
D602	2MB VLB	$259

SVGA Video Cards		
SVGA 256K Video Card		$29
SVGA 1024x768	1 MB	$59
SVGA VESA Local Bus		$79

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VISA MasterCard AMERICAN EXPRESS

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Controllers

adaptec

SCSI Controllers

1522	16-bit 7HD/2FD Kit	$148
1542C	Bus Master Complete Kit	$245
1542C+	Bus Master Kit with Corel SCSI	$312
2742	EISA Kit 14HDS	$395
2842	VESA Kit Fast SCSI II	$325
1510ACDK	For CD ROM	$95

AMI

SCSI Controllers

FastDisk EISA Caching Controller up to 16MB	$449
FastDisk VLB VESA Local Bus Caching Controller	$449

DATA TECHNOLOGY CORPORATION

SCSI Host Adapter, Supports 7 SCSI Devices, up to 8 BG each, Floptical support thru the BIOS

DTC 3270VL VESA Local Bus		$129
DTC 2278	VLB IDE	$39

TRANTOR

ASPI Device Driver for: CD-ROMs, Photo CD, Tape Drives, Syquest, Opticals, Scanners, Hard Drives	$49
EPP Mini SCSI	$209

BUSLOGIC

BUSLOGIC

SCSI Controllers

BT542	Busmaster SCSI-II Kit	$219
BT445S	VESA SCSI-II Kit	$299
BT545KT	Bus Master Fast SCSI	$229
BTB742KT	EISA SCSI-II Kit	$315
BTB747AK	EISA Fast SCSI Kit	$379

PROMISE
TECHNOLOGY, INC.

VLB Cache Controller

DC-200	ISA IDE Cache	$95
DC-200M	ISA IDE/512K	$129
DL-420	VLB IDE/512K	$124
DC-4000	VLB IDE	$55

UltraStor

SCSI Controllers

14F	FD/HD (10MB/sec)	$195
24F	EISA, 64K, Fast (33MB/sec)	$359
34F	VESA Local Bus Controller	$269

VITEX

DC-IDE/4FD/2FD/2S1P1G/2.88		$45
DC-IDE/VLB/2S1P1G Ext. to VLB		$27
DC-IDE/200	VLB/2S1P1G	$39
IO-2S2P	2 Serial, 2 Parallel	$25
IO2S2P/16552	Serial/16550, 2 Parallel	$45
MGP Card		$19
MCGP Card		$19

TECO

DC-600B	ISA/IDE Cache	$129
DC-620B	EISA/IDE Cache	$199
DC-680	VLB/IDE Cache	$149
DC-800B/1MB	ISA/Fast SCSI II Cache Mirroring Controller/1MB RAM Built-in	$299
DC-820	EISA/Fast SCSI II Cache Mirroring Controller	$79

ATEN

VESA IDE/IO 2S1P1G	$45
16-but Super IDE/IO 2-16550	$59
16-bit IDE/IO 2S1P1G	$25
2-16550 High Speed I/O Card	$42

NCR PCI SCSI II HD Controller		$125
GSI-21-V	**Intelligent IDE**	$69
Co-Resident	**Intelligent IDE**	$49
Printer Card		$25
AT/IO Card	**2 Serial, 1 Parallel**	$19
16bit IDE/IO	**2 Serial, 1 Parallel, 1 Game Parallel Port bidirector**	$49

HD

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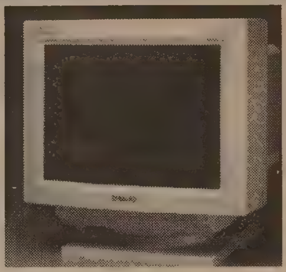
SONY



CPD 1730	17" SVGA	.25 dpi	$995
GDM 17SE1	1600 X 1280	.25 dpi	$1175
GDM2038	20" State of the Art		$2185

HITACHI

CM2095	20"	.31dpi	1280x1024NI	$1325
CM2187	21"	.28 dpi	1600x1280 NI	$2045

MITSUBISHI (IBM and Mac)

15"	Diamond Scan 15FS .28dpi Anti-static/Anti-Glare Flat Screen	$495
17"	Diamond Scan 17FS .28dpi Flat Screen with Invar Shadow Mask	$1045

NANAO

F550i	17"	Non-interlaced	1280x1024	.28 dpi	$955
F550iw	17"	Non-interlaced	1280x1024	.28dpi	$1159
F560iw	17"	AKA: the Green Monitor			$1375
T560i	17"	Non-interlaced	1280x1024	.25 dpi	$1629
T660i	20"	Trinitron Tube	1280x1024	.28 dpi	$2379
T750i	21"	Non-interlaced	1280x1024	.32 dpi	$1989
F760i	21"	1280x1024 @ 74Hz		.31 dpi	$2095

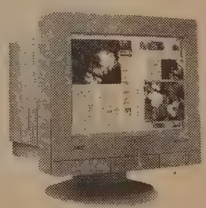
MAG

MX15F	15" Non-interlaced, 1280 X 1024, Flat Screen .28	$495
MX17GE	17" 1280 X 1024 Flat Screen .26	$915

14" Mono Monitor			$95
14" VGA Mono Monitor			$119
14" SVGA	.39 dpi	1024 X 768	$219
14" SVGA	.28 dpi	1024 X 768	$245
14" Non-Interlaced SVGA	.28 dpi	1024x768	$259
14" Standard	.28 dpi	1280x1024 NI	$285
15" Non-Interlaced SVGA	.28 dpi	1280x1024 NI Flat Screen	$385
KFC 17" Non-Interlaced SVGA	.26 dpi	1280x1024 Flat Screen 2 year warranty	$799

NOKIA (IBM and Mac)

449E	15" Max-80Hz	.28dpi Digi Control	1024x768 Green Monitor	$515
447B	17" Max-110Hz	.26dpi Trinitron Digi Control	1280x1024	$973
445M	21" Max-120Hz	.26dpi Digi Control	1280x1024 Green Monitor	$1999
445X	21" Max-120Hz	.26dpi Digi Control	1600x1200 Green Monitor	$2659



NEC

JC1431	14"	1024x768	$325
3FGe	15"	1024x768 @ 60Hz	$575
4FGe	15"	1024x768 @ 76Hz	$685
5FGe	17"	1024x768 @ 76Hz	$1075
5FGp	17"	1280x1024 (with Opticlear)	$1295
6FGp	21"	1280x1024 (with Opticlear)	$2395

ViewSonic *The New Generation*

ViewSonic 6E	14"	.28dpi Non-interlaced	$280
ViewSonic-15	15"	.28 dpi	$445
1280x1024 Non-interlaced, 76Hz at 1024x768, Flat Screen			
ViewSonic-17	17"	.28 dpi	$975
76Hz at 1280x1024, Non-interlaced, Flat Square Screen			
ViewSonic-20	20"	.28 dpi	$1575
1600x1280, Non-interlaced, Dual Page Display			
ViewSonic-21	21"		$1825

3.5" DS/HD Disk 25 pack $9.99

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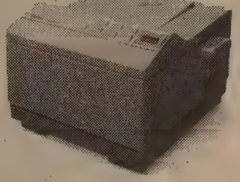

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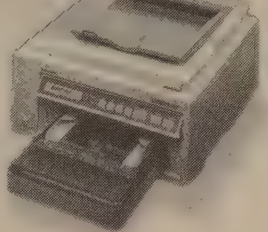

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Casio SF-M10:

Functionality In Small Package

BY MITSU HADEISHI

Casio has recently released a slightly smaller version of its SF-R20, a pocket-sized organizer with built-in spreadsheet capabilities, which they call the SF-M10. Much like the SF-R20 in many respects, it comes with half the memory (128K instead of the 256K in the SF-R20), but this is plenty of RAM for many people. Because of the efficient memory usage of the Casio series (like other dedicated organizers), it can use more of its 128K for data storage instead of using it for workspace RAM the way some less efficient full-blown palmtop computers do. The SF-M10 can be had for around $250 street, which is about $50 less than its larger cousin.

The primary advantage of the SF-M10 over the R20 comes from its smaller size (it measures 6 1/2" x 3 7/8" x 3/4", more than a half-inch less wide) and lower price. It's more in the price range of the consumer who's looking for a capable organizer but who doesn't need the full power (and cost) of a 256K machine.

Otherwise, the capabilities are quite similar; it includes all of the R20's functions—the calendar/scheduler, the memo pad, world time, to-do list, calculator, and other miscellaneous functions. Most useful of all, however, is the built-in Lucid "3D" spreadsheet. The spreadsheet is quite capable, including a simple macro facility and financial and scientific functions; in many ways it's more convenient than the built-in memo pad for taking notes, because the user interface of the spreadsheet is more sophisticated than that of the memo pad function.

One of the nice things about Casio's SF series is the sturdy connector between the keyboard/CPU and the display. Some associates and I have found that this component often goes out on our Sharp Wizards; sometimes it goes bad very rapidly, meaning that it is a good idea to get an extended replacement warranty from your dealer on these kinds of units. On the SF series, however, the connector is housed in a solid cylindrical casing, and appears much more rugged than the designs used on most other organizers. Battery life is quite respectable; according to the documentation, over one hundred hours of continuous use; this can mean that months go by before you use up the batteries.

Despite the M10's smaller size, its screen is approximately the same size as the larger R20's. It also displays just as many characters, making it useful for displaying moderate-sized spreadsheets (of course, the screen is much smaller than a standard PC, but for an organizer it's quite spacious at 10 x 40 characters). If you use the "title" function of the spreadsheet to turn off the row and column labels, this is wide enough to use for a simple checkbook spreadsheet or an expense tracking spreadsheet.

The keyboard is still very usable on the M10; it's QWERTY style like the R20, but despite the smaller size it's spacious enough. Since it does not have a numeric keypad, the keys are spaced widely enough to make typing reasonably easy (though of course true touch typing is not really possible). The SHIFT key does not work like its normal-keyboard counterpart; you have to press it, then release it, then hit the key you want shifted. After a short time this becomes second nature, and not as annoying as it sounds. Overall, the keyboard is a strong point of this particular organizer; they did a good job with the small space available. Many other organizers suffer from more difficult-to-use keyboards with even more cramped layouts.

Unfortunately, this Casio, like all the others in the B.O.S.S. series, suffers from a rather awkward user interface. This is ameliorated to a large extent, however, by the SF Series' online help facility and the fact that the spreadsheet can be used for many functions that might otherwise require some of the more cumbersome features.

The spreadsheet itself, written by Lucid (not Casio), is a far better example of user-interface design. Unfortunately there is no way to transfer data between the spreadsheet and the other functions without using the optional PC Link package, which costs an additional $130 or so street, and allows you to back up and transfer spreadsheets and other data between your Casio and your PC. Versions are available for both the Macintosh and the PC.

Overall, the M10 is a good value and a usable, if imperfect, product. I recommend it to those who want quality, who would rather spend a bit less, who want something lighter and smaller than the R20, and who are willing to put up with a few operational quirks common to all Casio B.O.S.S. organizers. All of the low-end organizers on the market today have some problems of one kind or another, but this is the least expensive organizer with a built-in spreadsheet capability. As such it represents an excellent value for a wide variety of light-duty applications.

News Tidbits

•Hewlett-Packard has announced that it's now shipping 2MB versions of the HP 100LX, priced comparably to the current

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1MB model. The new version will allow a larger amount of RAM to be allocated to virtual disk storage.

•New Media Corporation is shipping the high-speed Bus Toaster PCMCIA SCSI adapter. The Bus Toaster operates at speeds comparable to an ISA bus SCSI device; according to the company, a benchmark using a 386 notebook computer and a Maxtor 7213 hard disk showed the burst, sequential read/write, and random read/write speeds were the same as that measured with an Adaptec 1521 ISA bus SCSI adapter. The sustained random read/write data rate was over 1MB/second, bursting to speeds of approximately 5MB/second. This is about the maximum throughput one can expect from an ISA-class device, and it demonstrates the PCMCIA interface being pushed to its limit. The BusToaster draws 190mA of power during operation, and when not in use, it goes into "sleep" mode, drawing only 15mA.

The adapter ships with New Media Corporation's own ASPI manager as well as CorelSCSI v2. One advantage of the Bus Toaster is that it can be plugged into the computer even while it is on; this is a design characteristic of the PCMCIA interface, and the BusToaster takes advantage of it by allowing its ASPI manager to dynamically detect devices on the SCSI bus even if they're connected after the computer has booted. ISA SCSI adapters lack this capability.

The Bus Toaster uses the New Media Corporation's ultra-thin cable (1/8 inch) technology, which allows a cable narrow enough to enable two cards with similar designs to be used side-by-side even when they are stacked next to each other. Most other PCMCIA SCSI cards have thicker cables which block the card in a neighboring slot. Cables are available in Centronics, SCSI II, and DB25 configurations. Retail price for the card is $394 including CorelSCSI v2, and $359 without. The card is backed by a lifetime warranty.

THE CASIO SF-M10 IS THE LEAST EXPENSIVE ORGANIZER WITH A BUILT-IN SPREADSHEET CAPABILITY.

•Silicon Storage Technology has announced a line of low-power, high-capacity PCMCIA Flash RAM cards called the SuperFlash cards and the E2CARD series. These cards operate at both 3.3V and 5V (3.3V operation is supported only in some computers). The SuperFlash Card line has capacities from 1 to 4MB, and the E2CARD has capacities ranging from 5 to 15. The unique advantage of these cards is that they are engineered to allow precise, high-speed 512-byte sector erasure without spillover, and erasure can be done very rapidly compared to other Flash RAM cards. This allows DOS FAT filesystem compatibility without the need for a special "Flash File" system.

•Franklin Electronic Publishers, Inc., maker of the Franklin Digital Book System-1 and -2, inexpensive portable data-retrieval devices, has announced the Franklin Fantasy Baseball Analyst, a Flash ROM card that gives career statistics for over one thousand major league baseball players. The card is designed to be used in conjunction with the DBS-2, and utilizes Flash ROM technology, allowing Franklin to update statistics in the card at regular intervals. The card will retail for $249.75, including one update, and will have a maximum annual subscription renewal rate of $49.95.

Wizard Accessories

•Sharp Corporation, creators of the most popular line of personal organizers, the Wizard series, has created another in its line of Wizard organizers, the OZ-9520.

Like the OZ-9600II, the top-of-the-line model, it includes a touch screen and 512K of RAM. It is slightly smaller than the 9600, but it includes additional fax and email support capabilities which are not present in the 9600. The terminal emulator in the 9520 includes VT100 support, making it easier to use dial-up services which support that terminal emulation mode. The 9520 uses the combined pen-based and keyboard interface also found in the 9600. The unit lists for $719.99, but can be found for around $550 street price.

•A couple of new game cards have recently been released for the Sharp Wizard.

Organizer Chess (OZ-718M), allows storage of up to ten games for replay or review. One hundred famous historical games are also stored in the card for review purposes. The card plays at six different levels of difficulty, and has a "take back" and "suggest" mode of operation.

Organizer Chess lists for $109.99. Organizer Backgammon (OZ-8A02M) plays at three different skill levels, and includes "take back" and "help" features as well. The card retails for $49.99.

•A version of Quicken (the popular financial management program for the PC) is available as an IC card for the Sharp Wizard OZ-7000 and 8000 series organizers (9000-series support is in the works, apparently). Quicken transactions can be created on the Wizard and downloaded via the card to Quicken on the PC. The card is named the EZ-100, and lists for $110.

•Another couple of cards that some of you old-time Wizard owners might not have heard about include IQ Word (EZ-101), an 8000-series card which includes WYSIWYG word processing capabilities with type style selection and context-sensitive help. Data transfer to the PC is supported, allowing viewing and printing of documents and exporting to ASCII format. The EZ-101 retails for $259.99 but can be found selling at lower prices.

IQ Plus (EZ-102), also for the 8000-series only, is a multipurpose card, and it includes an A4 document editor/word processor, a user-definable database, a personal financial manager (including a checkbook facility with up to five accounts with separate budget categories), and an expression evaluator, and it can also operate as a programmable calculator. This card also lists for $259.99. ■

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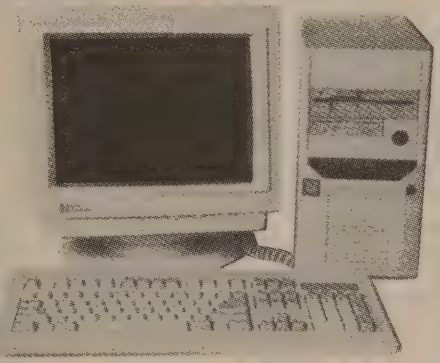

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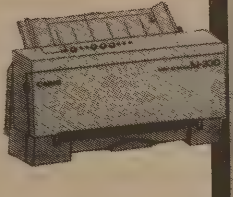

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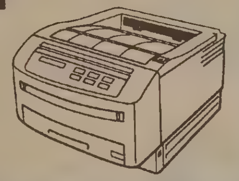

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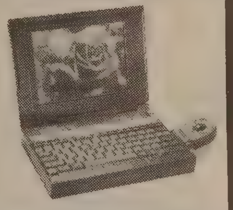

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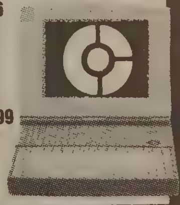

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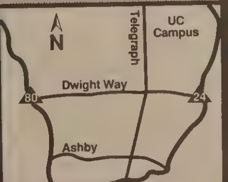

Nanao's Green Monitor

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BY ED KAHN

RESOURCES:

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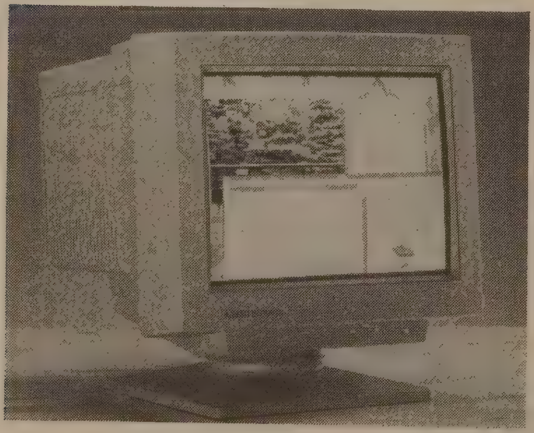
1-800-800-5202

No matter how good your portable computer system is, if you have one primary work location—the home or office—as well as on-the-go, I still recommend a good color monitor. A decent size monitor makes life a lot easier, especially with Windows. While some people recommend a 17" screen for Windows, for general applications a 15" display works quite well.

Nanao has a 15" model that offers everything I could wish for in a monitor. Not only is the quality of the display excellent, but their FlexScan F340i-W incorporates highly sophisticated power management into the design of the unit.

Recently, the Environmental Protection Agency (EPA) developed the Energy Star Program, a volunteer partnership between the EPA and manufacturers of computer components. The program requires that during periods of inactivity the products will "power down" to less than 30 watts. This monitor meets these standards.

LAPTOPS



The FlexScan offers other features that make its use a dream. In the old days, for instance, both the external monitor and portable needed to be turned off to conserve power. Now, when I turn off the portable, the Nanao monitor powers down to a standby mode that uses only a trickle of power and is ready to go as soon as I return to the computer. But this smart monitor not only saves power when I turn off the computer, it also saves power during prolonged periods of inactivity. This is convenient for people who leave their systems on much of the time.

For the monitor to know when to shut down, you must have a screen saver. The one that comes with Windows works fine, but to add a little spice, Nanao includes a version of Berkeley Systems' popular After Dark collection of screen savers that has been customized for the Nanao monitor. After the screen saver runs for a user specified time, Nanao's EcoLogic countdown begins. During this period of time a different screen display is shown which advises you how long before the monitor will enter Power Manager Stage One. During Stage One, you can touch the keyboard or mouse and the monitor will spring back to life within a couple of seconds. Power conservation during this phase is over 90%. You can specify how long you want the monitor to stay in Stage One before going into the deeper sleep of Power Manager Stage Two. In this mode, power conservation is about 93% and it will take several seconds to awake from this state. When you turn your computer off, the monitor automatically enters Stage Two.

There is a lot more to this monitor than efficiency. Nanao has designed the FlexScan F340i-W with ergonomic as well as ecological features. The screen is flat, which reduces glare so that I no longer need to use a glare screen. Another feature I particularly enjoyed is a coating to keep static buildup from developing. And finally, Nanao has incorporated a number of design features to reduce electromagnetic emissions. The FlexScan F340i-W complies with the Swedish MRP II guidelines.

This smart monitor not only saves power when I turn off the computer, it also saves power during prolonged periods of inactivity. This is convenient for people who leave their systems on much of the time.

To make this unit easy to use, all of the controls are on its front except for the master power switch, which is seldom used. After you first turn on the monitor, it is unnecessary to turn its main power off, as the monitor effectively powers down by itself. One of the great features of this monitor is its ability to let you adjust the size of the image to fill the entire screen. Unlike some monitors that force you to lose a half or three quarters of an inch all around the display, the Nanao lets you adjust the display out to the edge of the monitor as well as center the image. The result is that you really get a full 15" display.

When you adjust all of the image details, including subtlety of color, you can instruct the monitor to remember these settings. If you subsequently use a different portable or application that requires different settings, the Nanao will save these settings as well, letting you easily switch between the settings as needed. All together, the monitor can remember up to twenty-eight different sets of settings.

The color adjustments are designed to let you match screen colors to color printer output, letting you view on the monitor what you will actually see in hardcopy. It is hard to imagine a more flexible system.

Resolution on the FlexScan F340i-W is excellent. The monitor will work with VGA or Super VGA, and resolutions up to 1024 x 768. It has a .28mm dot pitch. Of course, it is noninterlaced for flicker-free operation.

I never thought I would have to refer to the documentation for a monitor, but there are so many features to this unit that it is actually necessary to read the booklet in order to get the most out of the monitor. The instructions are clear and concise.

The list price of the Nanao FlexScan F340i-W is $799, and the parts and labor warranty has been extended to three years. You will have trouble finding a better all-around monitor to use with your portable. ■

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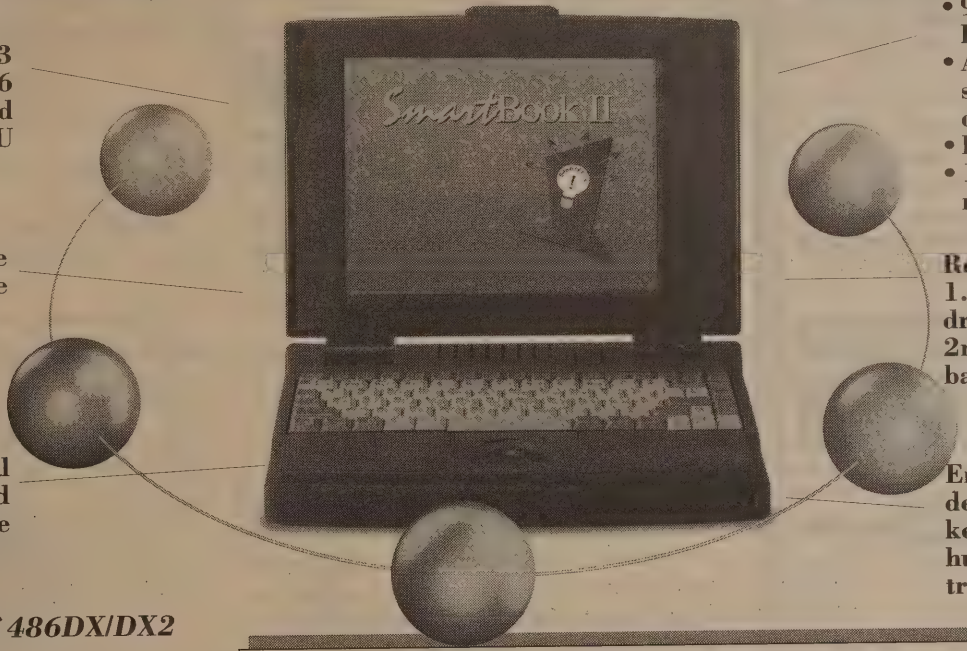
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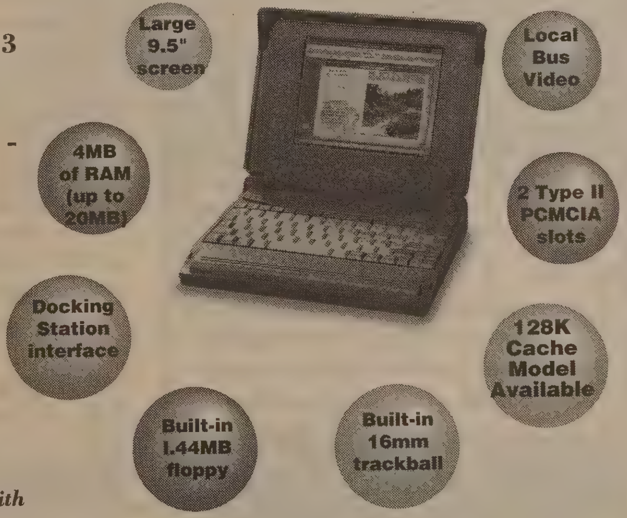
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LAPTOPS

COMPUTER OF THE MONTH:

Ambra N450C-200

For years, IBM has been playing catch-up in the world of laptops. Last year, they came out with a series of portables that rivaled any vendor. Finally, they had a really first-class product, but the price was pretty hefty for many users. The world of portable computer sales also changed during this time with the emergence of a host of high-quality vendors who were selling toprated portables through direct sales.

This change in the world of sales meant that excellent computers were available at heavily discounted prices. IBM studied the matter for some time and (for a surprise) decided that if you can't beat 'em, join 'em. They announced the formation of a new company to develop a wide range of PCs under the brand name of Ambra. These computers would be sold directly by Ambra and would not be available in retail outlets.

I looked forward to the introduction of these computers because the recent IBM offerings in the portable field had been so dynamic. I must say that Ambra still has a lot to learn. My first introduction to the company came in the form of a mailing I got, advertising a wide range of new machines. The only phone number given was an 800 number designed to take orders. I was completely unable to get through to anyone to speak about doing a review. The operator said she had no authority to connect me with anyone other than a sales representative. I left my phone number and never got a return call. Finally, I phoned a contact at IBM and told them the story. They were horrified and said that someone would call me. No call.

Ambra has included a local bus controller for the video output.

Eventually, I got through to the right person and they provided me with the laptop for this month's review. The Ambra N450C-200 is a pretty standard portable weighing in at 6.6lbs. It measures 8.5" x 11" x 2.25". It is powered by an i80486DX2 CPU running at 50MHz. It comes standard with 4MB of RAM, expandable up to 12MB. The standard configuration includes a high-density 3.5" floppy drive as well as a 200MB hard drive and two PCMCIA slots. The model I evaluated has a passive matrix color display. While this machine is powerful and has all of the features you need, I did not find it particularly exciting.

The most unusual feature of this laptop was its built-in trackball. While I prefer a mouse, I do appreciate a portable pointing device like the included trackball when I am on the go.

Ambra has done nothing wrong in the design of the N450C-200. Even though the keyboard is an excellent configuration with the cursor keys and the PgUp, PgDn, Home, and End keys just where you want them, Ambra recognizes that most users will want to use a full-size keyboard when they are in a primary location. To this end, they have included a PS/2 port on the back of the unit.

Likewise, they have made provisions for the addition of an external color monitor through the

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inclusion of a video port on the back of the computer. Interestingly enough, Ambra has included a local bus controller for the video output. This makes for a faster system. If you use an external monitor, you can use either a VGA or Super VGA model. You can also elect to use both the internal and external monitor simultaneously.

The Ambra N450C-200 operates on either AC current or from the removable, but included, battery pack. It will normally provide about two hours of operation. Recharge time is roughly the same. Extra battery packs ($89) are available. Sophisticated power management software and hardware are included. A hardware Power Management Unit automatically lowers the operating speed from turbo to standard whenever it is not processing an instruction.

There is both a serial and a parallel port. A PCMCIA Type III slot allows you to install two PCMCIA Type II cards. Ambra offers a variety of PCMCIA fax/modems ranging in price from about $200 up to $349 for a 14,400Kbps model.

A docking station ($499) attaches to the back of the unit. This gadget will hold four expansion cards—two standard 16-bit cards and two VESA local bus cards. Ambra sells an "Instant Office" package ($927) that includes the docking station, a 15" color monitor, and a full-size keyboard.

Ambra provides a one-year warranty and a 30-day, money-back guarantee. My reservations about the system are based more on Ambra working out the startup problems of a new company than on the product itself. The N450C-200 has everything you will need, including both DOS 6.2 and Windows 3.1. Never underestimate the power of Big Blue to get its act together. ■

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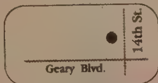

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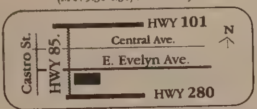

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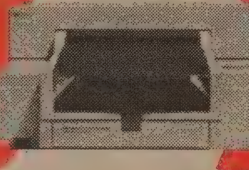

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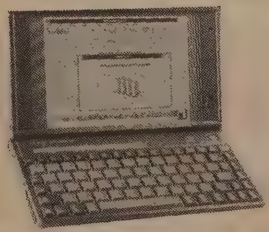

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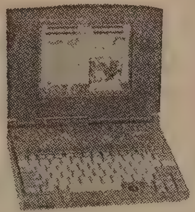

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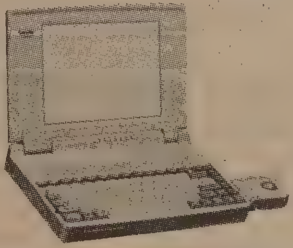

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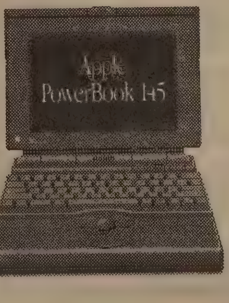

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Tax Traps For The Unwary

Suggestions For Technology Companies And Professionals That Will Help Avoid The More Frequently Encountered Missteps

BY DAVID A. SIMON, CPA AND JENNIFER R. CHERNISS

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David A. Simon, CPA (M.S., Taxation), is in tax and accounting practice in Oakland and writes on a variety of business issues. His clients include professionals and businesses throughout the state. He can be reached at (510)893-5753.

Jennifer R. Cherniss specializes in making boring technical information seem less so. Her writing services can be obtained at (510)893-5753.

Each year at tax time a percentage of frustrated taxpayers—more frustrated than the rest of them—is snagged by some tax trap or morass that could have been avoided had they known what to watch for. Some folks think of tax time as hunting season for IRS auditors. But with a little forewarning and forearming agains the hazards ahead, far fewer need fall prey.

DO YOUR TAX PLANNING BEFORE YOU SIGN THE DEAL

For tax purposes, once the contract is signed, the deal is done. If you didn't do your tax planning beforehand, you're probably stuck with the consequences now. As obvious as this seems, after-the-fact "planning" for tax implications sums up the theme of the most common difficulties encountered by technology professionals and businesses we see.

Software developers and programmers entering into development or licensing agreements seem especially prone to signing big-dollar contracts without first consulting their tax advisor. Only when it comes time to actually pay those taxes do they realize what ramifications were fixed at the time of the agreement.

Tax attributes should be an important part of the negotiation process, often entering the discussion at the earliest stages, because what benefits one party is likely to be bad news for the other. If one party is getting all the tax goodies, the other ought to pay less for the deal.

Here's an example of how tax issues can affect the value of a deal. Papaya Mason believes the source code she is writing will pass the tests for a software-related patent. She is negotiating with BlissTech, Inc., which wishes to acquire the rights. If Mason sells BlissTech all substantial rights to her patent (whether or not a patent has actually been issued), as opposed to contracting her programming skills, she may be able to structure a deal that qualifies for capital gains treatment, thereby receiving the favorable capital gains tax rate and avoiding employment taxes. She'll need to meet additional conditions as well.

But BlissTech is fighting the deal, because it would have to depreciate those patent rights over time rather than currently deduct a research expenditure. Worse yet, the IRS might argue that the deal involved the acquisition of "intangible assets constituting a substantial portion" of Mason's business. Under a new tax provision (IRC Section 197), such rights would take fifteen years to depreciate. Mason and BlissTech have some haggling to do.

▼

Even if a tax preparer is a CPA, if the firm employing him or her is not a CPA firm, registered with the Board,

you won't be protected.

Moreover, to avoid the extra long depreciation, they may first wish to ask the IRS to affirm, in a private letter ruling, that the transfer is free from the Section 197 catch; but the IRS may not agree to rule and the entire process must be completed rapidly enough that the software doesn't rot.

With ultimate recklessness, the deal can be structured such that neither party acquires the possible tax benefits. If, for example, in addition to the product being substantially all of Mason's business (resulting in rough treatment for BlissTech), Mason transfers the patent after already having sold a few copies of the software, thus disqualifying it for capital gains treatment on her part.

INCORPORATING TO SECURE CONTRACTS

If you've sought programming gigs through employee leasing companies, you may have had a body shop tell you that you'll need to incorporate for them to find work for you, or to place you at a particular site. Step carefully.

This trap catches too many naive contract techies. The arrangement poses many potential tax problems and hidden costs. Often the job shop is merely looking for a way to pass its employment tax obligations on to the worker. If you arm yourself with knowledge of the consequences, you'll be in a better negotiating position with the broker.

Incidentally, to get contract work without going through a middle entity, look amid the MicroTimes User Group Network listings, under "Associations." This resource presents groups and professional organizations where industry people go to make connections, stay in touch with developments in their field and marketplace, as well as share gossip and horror stories. These groups are a rich source of specialized job listings and leads.

PERSONAL HOLDING COMPANY TAX

If you do incorporate to provide consulting or engineering services, or licensing computer software, one of the nastiest traps is known as the Personal Holding Company (PHC) tax. This penalty tax is an add-on,

continued on page 160

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Pre-Screening Telecommuters

Finding Strong Candidates For Your Company'sTelecommuting Program.

BY ROBERT MOSKOWITZ

As telecommuting continues to proliferate through California, the United States, and the world, it's important to keep in mind that telecommuting works best for certain types of activities and certain types of people. Activities that require a hands-on physical presence and people who feel comfortable only working in groups are less likely to benefit from or succeed at telecommuting.

It's important to have everyone who'd like to telecommute go through a fairly-detailed screening process before they and their employer invest in the training, the workplace changes, and the equipment that might be needed to support the new telecommuter.

WHY TELECOMMUTE?

One of the first steps in screening a candidate is to get a full explanation of the reasons why this person wants to begin telecommuting. The wrong motivation, or mistaken expectations about telecommuting outcomes can create serious motivational and performance problems for the would-be telecommuter. Among the reasons offered by the candidate for telecommuting, you should find one or more of the following proven winners:

- To eliminate or reduce the time, cost, and difficulty of physically commuting to work.
- To allow longer concentration of important work projects.
- To allow greater flexibility in scheduling work time, and also in meeting special family needs, such as child- or parent-care, or as an alternative to temporary maternity leave.

WHY NOT TELECOMMUTE?

But just having the right reasons for wanting to telecommute is not enough. There can be many valid reasons why an eager and seemingly well-motivated candidate should not be allowed to telecommute. For a candidate to qualify, he or she should meet the following practical criteria:

- The candidate has enough room at home to set up a suitable workspace, or has an arrangement to telecommute from a suitable workspace in a commercially available site, in an "exchange" site approved by the company, or in a company owned facility near home. If at home, the workspace is preferably one with a door or at least a curtain that separates it from activities going on in other parts of the home while the telecommuter is trying to work.
- The candidate is willing and able to provide whatever furniture, equipment, resources, and services may be needed to establish a suitable workspace from which to telecommute, including a private workspace and perhaps a dedicated telephone line. Naturally, the more the company can or will contribute, the less must be provided by the telecommuter.
- The candidate has won acceptance of his or her telecommuting schedule from workplace colleagues, subordinates, and supervisors, at least enough acceptance so that he or she will receive adequate support when trying to work away from the office.
- The candidate has also won acceptance of his or her telecommuting schedule from family members and others living at home, at least enough acceptance so that he or she will receive adequate support and privacy when trying to work away from the office.

PERSONAL CHECKLIST FOR TELECOMMUTERS

If the motivation is well-founded and the practical situation is suitable for telecommuting, it's then appropriate to consider the individual's personal qualifications for adapting to this style of work.

In general, a person who will be successful at telecommuting shows elements of character and working style such as:

- Responsible and reliable, a person who has already established a pattern of delivering what he or she promises without falling back on lame excuses or recitations of extraordinary circumstances.
- Self-discipline and strong motivation to succeed both on the job and as a telecommuter.
- Self-sufficient, self-directed, and comfortable with the self-containment required of someone working in the more individual, isolated environment often experienced by telecommuters.
- An experienced self-starter who requires little or no direct supervision.
- Comfortable in an unstructured or minimally-structured work environment.
- Good communication skills, and strong relationships with many different people in the office or team environment.
- Able to "distance" him- or herself from the demands of family members and others at home while he or she is working as a telecommuter. Yet capable of maintaining a fair balance between work and family life over a long-period of time.

> **It's important** to have everyone who'd like **to telecommute** go through a fairly-detailed screening process **before** they and their employer **invest in the training**, the workplace changes, and the equipment that **might be needed** to support the new telecommuter.

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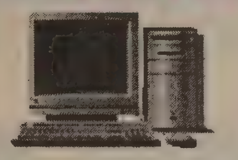

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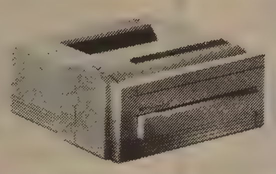

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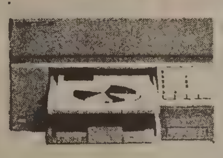

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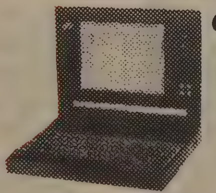

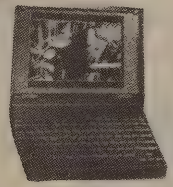

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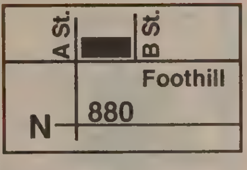

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JOB CHECKLIST FOR TELECOMMUTERS

Assuming the work environment is supportive of telecommuting, and the individual is personally a good candidate, the next important concern is that the work be suitable for telecommuting.

In general, work that can readily be accomplished by people working in the telecommuting mode is made up of:

- Reasonably discrete or separate projects, tasks, and activities.
- Individual projects, tasks, and activities that can be easily anticipated or accurately scheduled in advance.
- Relatively specialized projects, tasks, and activities that can be done away from the office.
- Individual projects, tasks, and activities that can be accomplished by an individual working alone, although they may require some communication with others over the telephone and other devices.
- Projects, tasks, and activities that generally result in some measurable results or specific deliverable.

SUPERVISORY CHECKLIST FOR TELECOMMUTERS

If all else checks out, it's critical to assess the support and motivation of the potential telecommuter's supervisor. Experience shows that without full cooperation from above, telecommuters have a very difficult time accomplishing their work and maintaining their role within the organizations.

In general, a supervisor who can effectively and successfully support a telecommuter is likely to be:

- Comfortable with supervision at a distance, or at least open to the potential advantages of supervising people who are not physically in the office every day.
- Flexible in the management of projects, and oriented more toward top-quality results than concerned with seeing people put in long hours.
- A good communicator and motivator who recognizes that an employee has a full life outside of work.
- Concerned with empowering his or her employees, and able to communicate trust through a coaching mentality.

THE TRIAL RUN

Once a candidate for telecommuting passes the pre-screening process, it's often advisable for them to convert to telecommuting at first on a trial or project basis. This lets everyone find out in practice how well the candidate can work as a telecommuter, without requiring the organization—or the candidate—to make a permanent commitment.

For a trial run, it's possible to pick a relatively isolated or unique project, the success or failure of which may not impact greatly on other aspects of the telecommuter's job. For example, writing a specific proposal, analyzing a specific contract, or designing a specific project plan are all relatively "isolated" projects the fledgling

continued on page 166

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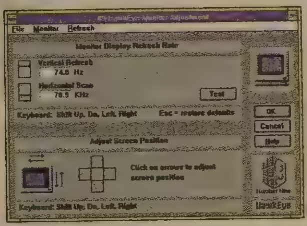
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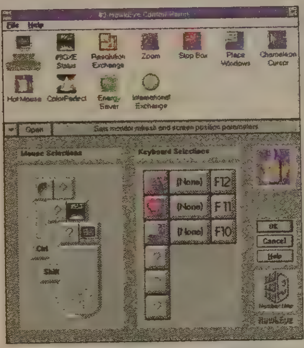
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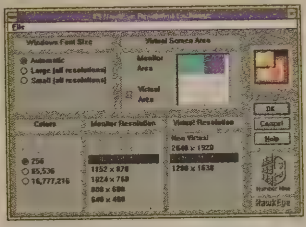
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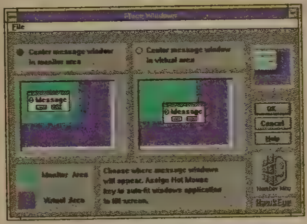
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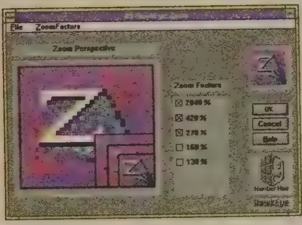
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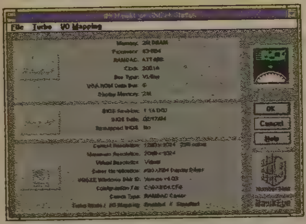
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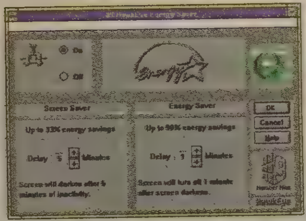
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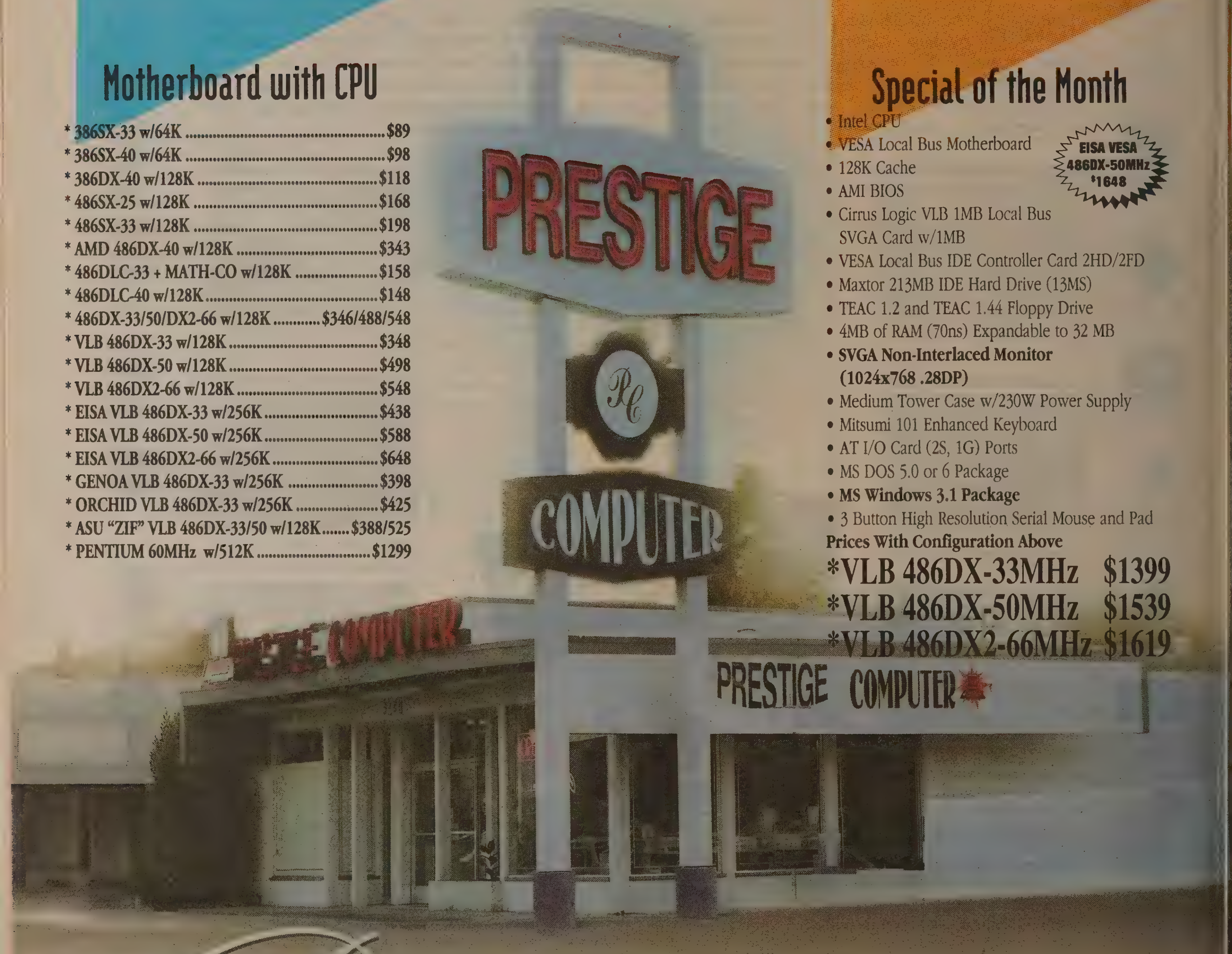

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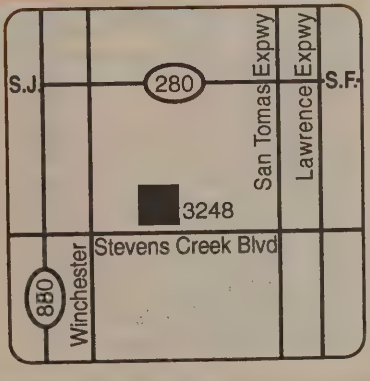

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486DX2-50C VLB	288	448	668	708	868	978	1,018	1,048	1,128
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486DLC-40/64C ISA	144	304	524	564	724	834	874	904	984
486SLC-33 ISA	84	248	464	504	664	774	814	844	924
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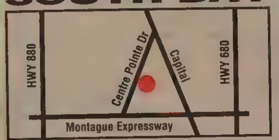

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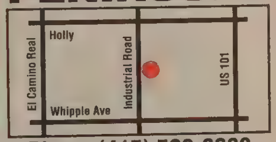

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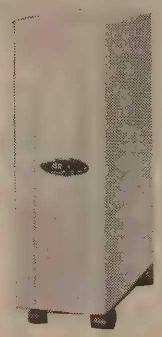

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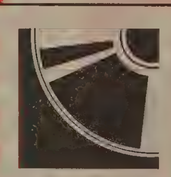

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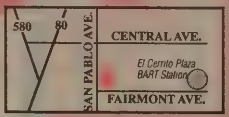

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LAN Packages for Small Businesses

LAN Packages For Basic File And Peripheral Sharing Services Without All The Bells And Whistles

BY PETER JOHN HARRISON

RESOURCES:

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1301 Shoreway Rd., Ste. 24
Belmont, CA 84002
(415)802-1080

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Tuscon, AZ 85745
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Los Gatos, CA 95032
(408)358-1550

Most LAN packages are intended to meet the needs of medium- to large-size businesses. High-end packages, like Novell NetWare, are designed to manage dozens of users, connect to other LANs, even connect into the Internet. They're solutions for businesses that need the versatility and power of a high-end networking solution, but if all you have is a few PCs at your home or small business, they're expensive overkill. What small LAN users need is an all-in-one LAN package that provides basic file and peripheral sharing services without all the bells and whistles.

LANs for small businesses and homes need to provide LAN users with access to shared peripherals, like printers, CD-ROMs, and hard drives, but they have to be very easy to set up and maintain. Recently I had a chance to install and work with three different LAN-in-a-box solutions that would work well for a small business or home LAN. Each is a complete solution, with LAN software and hardware in one box, costs less that $200 per computer, and is easy to expand as the network grows.

COACTIVE CONNECTOR

The most unique package of the trio is Coactive Computing's Coactive Connector. Coactive's LAN gets a blue ribbon for easy-to-install hardware: you just plug their adapter into the printer port of a PC compatible and connect it to the next Coactive Connector with a phone cord. Installing the software is almost as easy, and the Coactive Connector comes with a well-written, 50-page manual titled *How to Hook This Stuff Up*. It took me about ten minutes to set up two computers using Coactive's connectors and software, the fastest and easiest LAN installation I've ever done.

Once the Coactive Connector and its software are installed, you're ready to share files and printers with other computers on your LAN. Each computer on the LAN has its own name, a special directory on the hard drive where "shared" files are stored, and access to an N: (for Network) drive. To make a file available to other computers on the network, just copy the file to the N: drive, where there are separate subdirectories for each computer's "shared" file directory. Once a file has been moved to the N: drive, any computer on the network can access and modify the file.

> **LANs** for small businesses and homes need to provide **LAN** users with access to shared peripherals, like printers, **CD-ROMs**, and hard drives, but they have to be very easy to **set up** and maintain.

Mac users might recognize this networking scheme. Coactive is compatible with AppleTalk and PhoneNet, so you can network Macs and PCs with Coactive's system—a big plus if you have both Macs and PCs. Printing is easy too—you just use Coactive's software to select a printer attached to another computer, and print.

The Coactive Connector is straightforward and easy to use, but its simplicity comes at a price. Coactive's LAN won't let you share CD-ROMs or tape drives, and as networks go, it's slow. AppleTalk networks transfer data at 230Kbps, a small fraction of the speed of other network solutions and only twice the speed of a really fast modem. Still, if you have both Macs and PCs, or you don't feel comfortable opening your PCs up to install network cards, the Coactive Connector is a real winner.

SIMPLY LANTASTIC

Artisoft's Simply Lantastic is a scaled down version of their Lantastic/AI network, and it has a lot of the muscle of its larger brother. First, there are two versions of the Simply Lantastic package, one with network cards, one without, so if you know a little about network hardware, you can pick your own adapters (just make sure the adapter will work with "NDIS" drivers). For the rest of us, the Simply Lantastic Starter Kit comes with everything needed: two network adapters, a 25' LAN cable, and software for

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Coactive's **LAN** gets a blue ribbon for **easy**-to-**install** hardware:

two desktop units.

Installing the Simply Lantastic network cards was easy. After opening up my computer, all I had to do was find an open slot and install the card in it, then use Artisoft's special cable, which looks like a long extension cord for a set of headphones, to connect it to the next computer. Installing the hardware in my two desktop systems took me less than fifteen minutes.

The software was easy to install, too. But I did encounter a problem with my CD-ROM equipped system, and it took some hunting to find it. During the Simply Lantastic install, a line was added at the end of my AUTOEXEC.BAT file to load the network, but during the boot process, messages flew by on the screen complaining that my CD-ROM driver had been loaded, and Simply Lantastic needed to be loaded before my CD-ROM driver. A fast finger on the "pause" button when the message came up helped me diagnose the problem, and it only took me a few minutes to edit my AUTOEXEC.BAT file to fix the problem. Everything would have worked smoothly if the installation software had done the job for me.

Once up and running, Simply Lantastic was easy to use. After twiddling for a couple of minutes, I'd set up my LAN so that I could access my "big system's" disk drive, CD-ROM, and printer from my other system, which only has a hard drive, and I was able to back my small system's hard drive up using the big system's tape drive. To finish up my testing, I sent some email to myself using the basic email package that comes with Simply Lantastic.

The Simply Lantastic Starter Kit is a great package, but it does have one limitation that may not make it a good solution for your home or business. Currently, there is no Simply Lantastic adapter for laptops. Perhaps Artisoft will address this shortcoming in the months to come, but for now Laptops aren't part of the Simply Lantastic networking solution.

you just **plug** their adapter **into** the printer port of a **PC** compatible and **connect** it to the next **Coactive** Connector with a **phone cord.**

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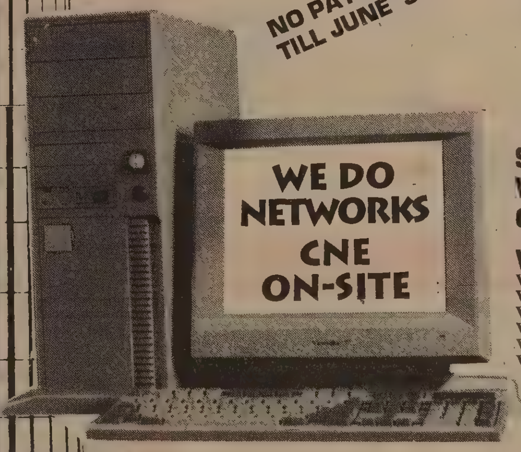

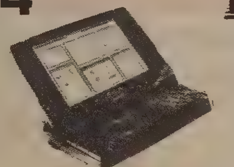

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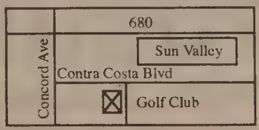

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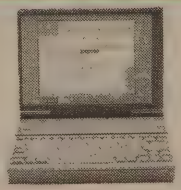

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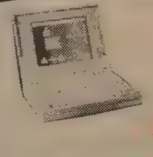

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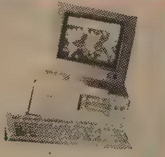

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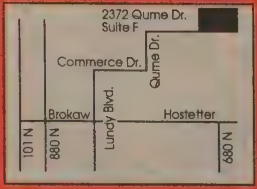

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Coactive is compatible with **AppleTalk** and PhoneNet, so you can **network** Macs and PCs with **Coactive's system.**

back up the other two computers. I was also able to control what files each user on my LAN could access and change.

Moses Computing's Network Operating System can be set up to provide read-write, read-only, or password protected access to individual directories on each machine, so households with inquisitive children can keep the kids out of the financial records, and small businesses can make price lists available without having to worry about them being accidentally changed or erased. Simply Lantastic and the Coactive Connector can only provide full access to files or none at all.

I really like Moses Computing's LAN hardware and software. Of the three products reviewed here, theirs is very robust and the cheapest, but installing their system took much more time and technical knowledge than was required for Coactive Connector or Simply Lantastic. I had to resolve interrupt and DMA channel conflicts to get the MosesALL internal adapter to work with my "big" system Sound Blaster card, and once again, I had to troubleshoot and manually edit the AUTOEXEC.BAT file to get the LAN and CD-ROM drivers to work together. I also had to call the Moses Computing technical support people (who were very helpful) to get answers on how to set Windows up to work with the LAN, a subject not covered well in their manual.

There is something to like about all three of these networking products. To find the right solution for your needs, you need to think about what kinds of computers you want to network, your level of computer know-how, and the environment you'll be using your LAN in, then compare your needs to the features offered by each of these products, and make a choice. Once everything is set up, you'll be surprised at how easy networking can be. ■

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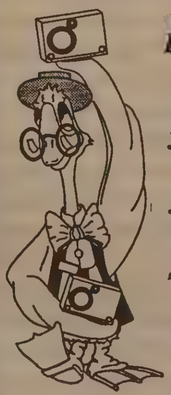

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A Short History Of Money-Making Ideas

UNIX As A Stealth Force In The Marketplace

BY BENNETT FALK

Frequent observers of this space already know that the UNIX industry is a Big Thing. We're accustomed to measuring the industry's progress from year to year by looking at the UNIX-related revenues of a handful of very large corporations: IBM, Sun, HP, AT&T, Novell, Oracle, Sybase, Informix, and SCO. These are companies that make lots of money from the UNIX operating system itself, from bundling UNIX with their hardware, and from producing application software to run under UNIX.

There is more to the business of making money with UNIX than these large companies represent. If the giants of the UNIX industry succeed, it is only because their customers have some idea about how to make an investment in UNIX profitable. Over the last twenty-five years UNIX entrepreneurs have had some curious ideas.

Early versions of UNIX (between 1970 and 1979) were largely a convenience for the research community at Bell Laboratories and assorted universities. UNIX provided tools for interactive software development that were certainly superior to punch card systems. If you were willing to learn a programming language for document formatting, something like word processing facilities were also available in early UNIX. Bringing these two disparate functions together in a single computing environment promised a new era of office automation.

Had Bell Labs been a hotbed of commerce, early UNIX could have challenged the desktop dominance of the IBM Selectric Typewriter, but product positioning was not Bell Labs' strong suit, and UNIX spent most of its first decade as a kind of think-tank curiosity.

TIMESHARING: MUTATE AND PROSPER

Between 1980 and 1982 microprocessor technology made UNIX systems affordable outside the research community. The first commercial idea was simply to offer the general public access to the same kind of computing resources the research community enjoyed. Users would pay only for the resources they used. The modern timesharing service was born with carrels for drop-in users and dial-in lines for users with modems. In the machine room, a "super-micro" of some sort with perhaps 8MB of memory served as many as thirty users stumbling for the first time through the mysteries of hierarchical directories and the UNIX Shell.

No one was sure exactly what the general public would be able to do with this sort of computer access, but computers had captured enough of the public imagination to make the idea of UNIX access appealing for a while. This appeal was short-lived. Application software for UNIX systems was still largely undeveloped, and the general public wasn't exactly teeming with software developers. The personal computer revolution made computer ownership relatively inexpensive and provided more (and more easily used) application software.

Curiously, commercial timesharing survived the indifference of the general public to the notion of renting access to a UNIX computer. Timesharing services took a cue from personal computer bulletin boards and began to promote UNIX systems as a vehicle for communication. This was a good move: people were reluctant to rent computer time for the privilege of using nroff or ls or vi, but they would happily subscribe to services that let them socialize.

At first the new generation of timesharing businesses were stand-alone conferencing systems (like the WELL of eight or nine years ago). More recent systems (like the WELL of today or Netcom) emphasize their connections to global networks. Today the timesharing notion of renting time on someone else's computer is stronger and more profitable than ever.

THE DAWN OF RDBMS

The UNIX industry's second wave of business opportunities came in the mid-1980s (roughly between 1983 and 1986) with the development of relational database management systems (RDBMS) for UNIX. The UNIX database systems were easier to use than existing mainframe systems. They also provided multiuser access to a common pool of data, and this was an advantage the personal computers of the time could not easily erase.

The manufacturers of RDBMS software (Oracle and Informix in the early 1980s, and Sybase somewhat later) became big companies. A host of smaller businesses got very big providing database consulting services.

Where the timesharing businesses had attempted to market UNIX access to the general public, the RDBMS boom was aimed primarily at corporate customers. Before UNIX became commercially viable and before the proliferation of personal computers, corporate data processing was done in data processing departments that did nothing but process data and take care of the Very Large Computer on which the data resided.

Personal computers proved to be a resource that data processing departments were unable to control, and when UNIX database management systems became available, the authority of the centralized data processing department eroded even further. Business units, departments, and local workgroups of all sorts used the new database technology of the mid-1980s to take control of their own data. Managers of relatively small workgroups in large companies began to act like entrepreneurs as they shopped for cost-effective ways to

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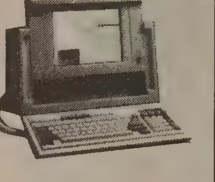

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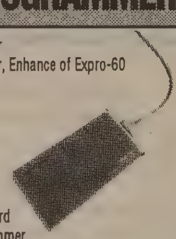

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process their data and publish it to other departments.

Corporate customers bought (and used) UNIX systems in order to take advantage of database applications. Even though UNIX provided a stable framework for multiuser database access, the database technology eclipsed the operating system. During the database boom, it was data access (and not just computer access) that proved lucrative. The people who used and benefited from UNIX database systems encountered the operating system itself only incidentally, and UNIX became entrenched in business without a lot of people learning how to use it.

WORKSTATION MEETS PC

Along with the emergence of multiuser database technology, the mid-1980s also saw the introduction of a new kind of UNIX computer: the engineering workstation with a Graphical User Interface (GUI) connected to a network of similar workstations. These computers were essentially powerful single-user computers that exploited UNIX multitasking to improve the productivity of the people who used them. The GUI made it possible for the user to keep track of several things at once, and the network enabled coworkers to collaborate more efficiently.

Engineering workstations succeeded spectacularly in the short term: they stimulated demand for powerful desktop computers, and for a while between 1988 and 1990, it seemed as though the desktop computer market was the only market in which success mattered.

However attractive they were, engineering workstations also raised troubling questions about ease of use. Network connectivity and a spiffy user interface did not necessarily guarantee increased productivity: whoever sat at the keyboard still had to know what to do. The general public wasn't exactly teeming with engineers either, and for most users, the almost-as-powerful, cheaper, easier-to-use personal computer was a perfectly adequate workstation substitute.

CLIENT/SERVER

The desktop wars continue to be important for hardware manufacturers, but the attention of UNIX entrepreneurs has been captured by another notion of how to realize a profit from UNIX. In the last few years, most of the functions for which we depend on computers have been redesigned using client/server architecture. Increasingly, UNIX computers are being used as servers in this architecture to manage all kinds of resources for consumers that are working on other computers.

The good thing about the client/server paradigm is that the server doesn't have any users in the traditional sense. Servers are essentially robots that are used by client programs. The human user masters the client program which, in turn, manipulates the server behind the user's back. In a well-designed client/server system, the user need not be aware of the server at all.

File servers and database servers have become common, but the UNIX automaton has much wider appeal than that. For example, the client/server notion makes UNIX systems a reasonable alternative for "point-of-sale" systems in retail, where at the checkout stand, cashiers use a scanner (or some other familiar piece of equipment) to enter information about purchases that is immediately transmitted to both inventory control and a module that tracks the cashier's cash drawer. (One of the early systems for creating custom audio tapes in record stores used an automated modem connection to a central UNIX computer to track sales and royalty information.)

In the corporate world, the trend to centralized UNIX servers has also been the occasion for rebuilding data processing departments or Management of Information Services (MIS) groups. These groups now find themselves the custodians of large UNIX systems that publish resources of all sorts to network users and have relatively few interactive users.

These ideas about making money with UNIX have fallen in and out of style, but all of them seem to be popular now. What the heck, it's spring, and it might be a good time to think about going into business. Just do it carefully. ■

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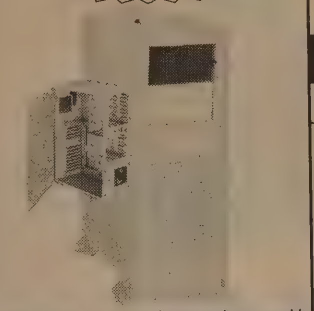

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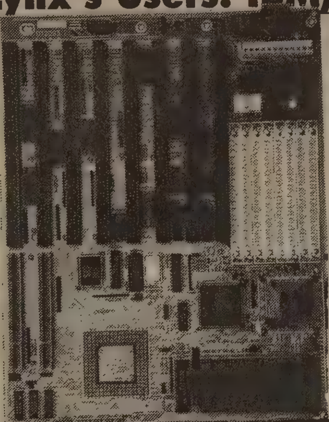

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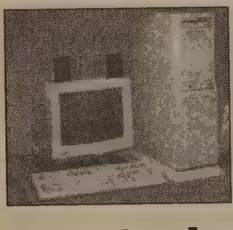

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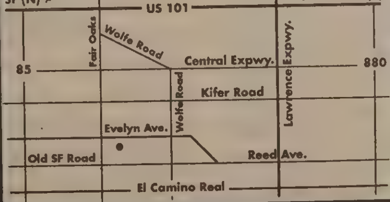

OS/2: Getting Better SatisFAXtion

In a previous column ("Better Multitasking Under OS/2," May 3, 1993) I wrote as follows:

BY FABIAN PASCAL

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97124-6497

PMFax
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8600 Jewel Ave.
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"*To take best advantage of OS/2 [you] can opt for an Intel SatisFAXtion/400 faxmodem. This is currently the only faxmodem with a built-in processor to which fax processing is offloaded, releasing the CPU to other tasks... The...fax component uses the physical address of the high IRQ10 interrupt. The data component emulates the 16550 UART [used by many current] serial ports, [which implements a 16-byte FIFO buffer for high-speed communications and can be configured to use] the IRQ3 or the IRQ4 interrupt.*"
The advantage of coprocessed fax in the OS/2 multitasking environment is rather obvious. But what about the data component of the SatisFAXtion? Does it offer any advantages for OS/2?

In fact, at the time I wrote the article the 400 was not emulating the 16550 UART, but actually the older 16450 UART. And at the 400's high data communication speed of 14,400bps, 16550 support is pretty important. OS/2's IBM communication drivers (COM.SYS and VCOM.SYS) do exploit it if available, and so do some third-party drivers.

Recently Intel released a new version of the 400 which does emulate the 16550. The purpose of this article is to clarify the practical implications for the OS/2 user.

U...ER...ART?

In the IBM PC architecture the serial port uses a chip with a special integrated circuit called "Universal Asynchronous Receiver/Transmitter" (UART). Initially there was an 8250 UART, which was later replaced by a faster 16450 UART. The latter was the standard for a long time, but with increasing data communication speeds, its reliability was not sufficient—there could be data overruns (see the sidebar on the following page).

The 16550 UART used by current serial ports was devised to resolve this problem at the maximum speed allowed by the IBM PC, 115KB. The 16550 is compatible with the applications written for the older UARTs, but software written to take advantage of its specific capabilities benefits from more reliable fast data communications.

Most of the 16550's advantage over the 16450 comes from its first-in-first-out (FIFO) buffer, devised to avoid data overruns at high data speeds. The FIFO buffer is accessible to the PC's CPU.

But at the time the original SatisFAXtion came out there was no 16550; the serial standard was still the 16450, so to avoid overruns Intel used a UART which implemented a buffer of 1024 bytes and called it Smart UART (as explained in the sidebar). The buffer, however, is internal to the faxmodem, and accessible only to the coprocessor.

Note: External modems connect to a PC's serial port which is equipped with a UART chip. Internal modems connect directly to the system bus and usually have their own UART chip on board, but some—the SatisFAXtion among them—emulate the UART function in software. Coprocessed fax can only be implemented in an internal faxmodem, which is why Intel used it only for the internal (400i) version of the SatisFAXtion the external version does not have the coprocessor.

16550 SPELLS CPU RELIEF

Note very carefully that the Intel explanation in the sidebar refers to the DOS/Windows environment. DOS is single-task, while Windows is a "virtualized" multitasking operating environment (that is, it only simulates multitasking). And as Ward Yelverton points out on CompuServe:

"...[There is] not any [overrun] problem under OS/2 since it is a preemptive multitasking environment and the communication port gets attention when it asks for it ([the serial port driver] issues an Interrupt Service Request [ISR]). Windows is not preemptive and the CPU doesn't pay any attention to the port until the program that presently has the focus releases it—meaning you're at the complete mercy of the generosity of the particular programmer [who developed the application] and the way you've set up the time-slice sharing."

In other words, loss of data is less of a problem because, unlike DOS and Windows, OS/2 can make the CPU pay the necessary attention to the serial port so that no data are lost. And if so, should the OS/2 user care which UART is emulated by the 400?

Well, if you have a fast system and you do not run many applications simultaneously, the UART makes little difference. If you opt for OS/2, you should, indeed, have the appropriate hardware resources for it (which means a fast machine). But one of the main advantages of OS/2 is multitasking, and with a heavy task load the Smart UART is not equivalent to the 16550.

An important issue is the frequency with which the communication port can issue ISRs to the CPU to take care of arriving data. And as Shmuel Metz argues:

"The best UART in the world will be slow if the interface throttles it down sufficiently. The speed of the underlying hardware doesn't mean squat if a separate interrupt must be serviced for each character...a 16450 with a big buffer is *not* better than a

continued on page 168

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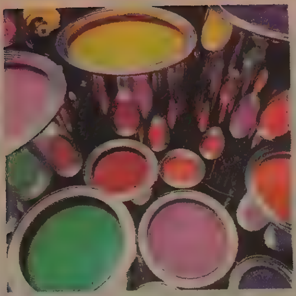
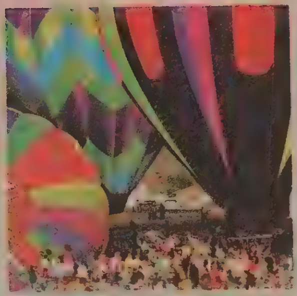
Fabian Pascal is a San Francisco independent consultant, teacher, and writer specializing in relational database management, OS/2, and office and portable computing. An industry analyst, he teaches seminars, consults, and has published extensively. He is author of SQL and Relational Basics *(M&T Books, 1990) and* Understanding Relational Databases *(John Wiley, 1993). He can be reached on MCI Mail (FPascal), CompuServe (73677,3306), or at (415)776-5184.*





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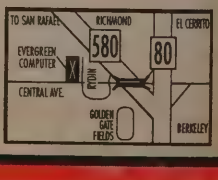

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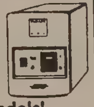

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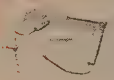

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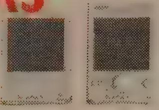

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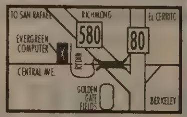

The Customer Database

What To Consider When Designing Your Customer Database

BY RICHARD CLARKE

Marketing and sales automation offers an important opportunity to focus your company's resources on providing service to existing customers and reaching out to prospective new, customers. The core of any sales automation system is the database used to collect information. The goal is to collect and organize data that enables you to become more effective in dealing with your present customers and in developing new ones.

To get the most from a marketing and sales automation system (MSA) you need to think carefully about the data you want to keep in your customer/prospect database. This article presents an overview of the issues involved in designing your database, presenting both business considerations and computer resources.

From a business viewpoint, you will need to consider several things including: What customer information is key to your company's business? What other customer functions can be handled with the system? How can you identify and manage the "sales funnel"? What information is needed about the company and the individual contacts within that company to support the sales process and improve your ability to market your products? What reports will you want access to?

On the hardware and software side you need to consider the size of your database (now and in the future), and to understand the implications of database size on system performance. You also must know if the software you are considering has the capabilities to handle the data you need, and if it has the ability to generate the necessary reports as well as execute direct marketing campaigns.

EXAMPLES FOR THE FIELD

To help draw the picture of how to utilize an MSA system, it might be helpful to look at several examples of what other companies have done.

- A ship repair company wanted to improve its selling efforts. There are only a limited number of vessels in the world that they could perform repair services upon, and they were able buy a commercial database that included the vessel information. The heart of this "customer" database is information on each of these vessels—containing details about repair history. This meant that the company could better target its selling efforts. Interestingly, people they deal with are, to some extent, subordinate to the individual vessels they could perform work on.
- A computer value-added reseller (VAR) faced a problem of managing installation orders. Customers often provided only sketchy information that would be turned into detailed orders of what to purchase from various suppliers. Each item needed to be tracked into the customer's installation, as well as its operation and warranty status. For this VAR, adding an "Installation" database to the normal contact database was the key to the successful use of the system.
- A nationwide computer reseller needed a way to refer customers to the correct local vendor for specialized repair services. What this company needed was a "Customer Support Database." This database showed each potential repair facility, its capabilities, and rating information about the quality of the services performed.
- A software supplier who sold its product via annual licenses had the problem of knowing when the older licenses were about to expire, so that the sales force could get a renewal from the customer. This company's PC-based MSA (PC MSA) system provided an easy way to track this information and generate the reports that keyed the sales force to get the renewal order.

RELATED USES FOR THE SYSTEM

What was originally conceived of as a "sales system" can often be extended into other customer management issues that affect your entire company. One opportunity for many companies is customer service and repairs. Using PC-based MSA to track repairs and customer problems lets the sales force better serve the customers. Many times a salesperson will be blindsided with a repair problem when calling on an account. If you extend your MSA for this function, your sales staff can know about the problems your customer is having, and can find ways to turn a "negative" (that is, a customer problem) into a "positive" (showing your customers how far you will go to support them when there are problems).

You can put an end to those problems through the internal communication capabilities of the PC-based MSA system. Capture the data, communicate it to sales, and unleash your sales force with a new customer satisfaction tool.

SALES FUNNEL MANAGEMENT

The "sales funnel" is a common way of describing the progression of a "prospect" (or "suspect" in some companies) to a customer (and repeat customer). If you can make the sales funnel visible, then you can know how many prospects you are working with, and at what stage they are in terms of becoming a customer. Further, if you can capture data about the potential customer as they move within the funnel you will have a better understanding of how long it takes a prospect to become a customer.

To know where the prospect is within the sales funnel, a common technique is to use an "interest code" within each record. The basic set of interest codes I usually recommend is a simple numerical system, from zero to nine. This system is shown below. Note that the system shows a disciplined sales process where first interest is determined, then the customer is qualified. After the prospect is qualified, the "product sale" is done. When the prospect is committed to the specific product, then the "business

The goal is to collect and organize data that enables you to become more effective in dealing with your present customers and in developing new ones.

Copyright © 1994 by Richard Clarke. All rights reserved. Richard Clarke, a marketing specialist, is presently a consultant specializing in PC-based marketing and sales automation at The OMT Group in Santa Clara. He can be reached at (408)266-6109.

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sale" (final price, delivery, and terms) is done. The product sale is done before the business sales so that the salesperson can sell the features and benefits, rather than just on price.

TYPICAL INTEREST CODES
0 Not a prospect
1 May be a prospect later
2 Prospect
3 Interested
4 Qualified
5 Product sale
6 Business sale
7 Final qualification & decisions
8 Customer
9 Repeat customer

When you have an interest code as data in each record, a prospect's place in the sales funnel becomes more visible, and it will be easier to see where all your prospects presently are within the funnel. One of the problems with the interest code, though, is that it is a "static data" field, that is, you know what the data is now, but you do not know when it moved from one level to the next. This can be solved by using a "results code" in your contact history record (if this field is available within your contact management system). The "results code" in the contact history is tied to a date, so you can then measure how long it takes a prospect (or a group of prospects) to move through each stage of the sales funnel. When you know this, you are armed with a much higher level of understanding of just what your sales process looks like.

TARGETING YOUR MARKETING AND SALES EFFORTS

An important use of PC MSA is to conduct outbound marketing campaigns, either by direct mail, telemarketing, or a combination of the two. To do this you need to capture information that describes your prospect's and customer's product interests, as well as the types of business they are engaged in. You may also want information about how big their company is.

Consider also what you will need to know to effectively target new product or service introductions. If, for example, you conduct mailings or send out a newsletter, you will need some kind of "mail list" code as a part of the database.

One other important piece of information to keep on each customer and prospect is "lead source." This allows you to see where your customers come from and can more effectively focus your effort to find new customers. In the long term, this is one of the most important pieces of information you can have about your customers.

WHAT IS "A RECORD"?

Should the records in your database represent a company or individuals? This is not always an easy question. If you want to have each record stand for a company, what do you do when you have a number of deals going on with different people within one company? And if you have separate records for each individual, how do you know what is going on for the overall company?

Each person that the salesperson had regular dealings with should be a "record." Some of these people may never be "customers." They may be advisors or administrative personnel of customers. They may be suppliers, not customers. They may be project team members for a project you are doing for or with the customer. They may be other supporting characters to the conduct of your business. They are the people with whom your salesperson communicates in the course of the business day.

Within each company are specific people who are the source(s) of your business. Know who these people are, make sure they have a record and are properly noted within your database. Keep track of the business that flows from these people.

Within your database should be a code that tells the status of each record—whether this record is for a customer, advisor, support staff, supplier, etc. You can also use this code to connect individual customers to their companies or a business category.

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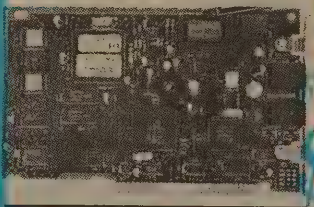

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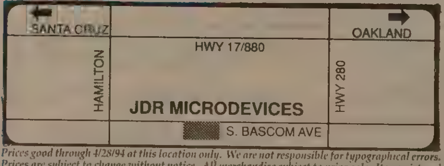

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CREATING REPORTS

Report needs must be considered in the database design to make sure you have collected the information you need, as well as the ability to access the information for specific types of reports. For example, if you want to see information for a region that contains several salespeople, each record needs both a salesperson code and a region code. For this you would want to report on individual salespeople, individual regions, and all the regions taken together.

IMPACT OF DATABASE DECISIONS ON COMPUTER RESOURCES

The performance of your database depends on two main elements—how big your database is, and how big the individual records are. If you have a very large database (in the tens of thousands of individual records), a database with many fields may be cumbersome to run on a standalone PC. Disk drive capacity is inexpensive now, so the cost of storage is really not an issue. The issues are really accessibility of an individual record; how long it takes to perform a simple database search, and how long it takes to select records and compile reports.

If your records are under about ten thousand, you can probably have individual records with many fields.

Fast access to an individual record depends on the indexing system of the contact management program you are using. Look for one with a variety of indexes, and some flexibility in indexing.

The speed of database searches and reports depends on how many records you have, how fast your disk drive is, and the complexity of the search. I would recommend that care be taken to prevent fragmented files. This can slow down these database functions dramatically. If you need to run big reports at the end of the day (like in the old days of mainframe computers) you might need to invest in higher-level technology to improve this process.

IMPLICATIONS FOR SOFTWARE CHOICES

As you examine software packages, keep in mind that the software is the vehicle for collecting and accessing your data. Any problem with the software in performing these functions means that it is not usable for your purpose.

If the software is open-ended in terms of how many user fields can be set up, then it may be robust enough to handle your company's sales automation as it grows.

Some contact management software allows you to set up custom "screens" that can use both standard data fields and custom user fields. This software is much easier to adapt to your actual situations than software without custom screen capability.

Also, remember to check the indexing system of the software. The indexes are what lets you move rapidly from record to record. This is one key to success.

CONCLUSION

Marketing and sales automation can bring great benefits, but you have to think about the problems and issues. It is especially important to consider what data you want to keep in the system and how you can use that data.

You need to approach the problem with an open mind, and be willing to look at the big picture. Maybe there is a critical business function you can also build into your system. If so, then the benefits to your company will be even greater.

Companies are making breakthroughs in their ability to respond to their customers using these tools. You can too, but you have to balance your desire for information against the cost of gathering and maintaining it. You have to remember a rule about information: "If the information helps make better decisions, then it is valuable." If there is information that is "nice to have" but does not help make better decisions, then don't go to the time and trouble to collect it. Also, be willing to use outside help to understand the opportunity you may have to impact your business. Sales automation can bring great rewards. You have to be willing to make an adequate investment in it before you can achieve this success. ■

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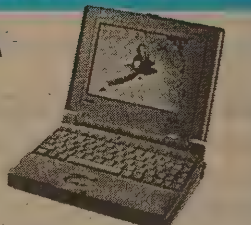

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Nanao 550i-w	1050

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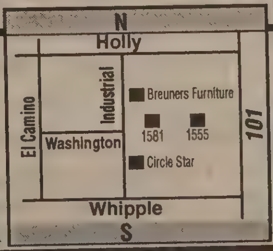

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- *TEAC 1.44MB Floppy Drive
- *KeyTronic 101+ Enhanced Keyboard
- *Microsoft Compatible Mouse w/ Pad
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- *Mitsumi 1.2MB & 1.44MB Floppy Drive
- *Mitsumi 101 Enhanced Keyboard
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- *Trident 8900CL SVGA 1024X786 Graphic Card w/1MB
- *Mitsumi 1.2MB Floppy Drive
- *Mitsumi 1.44MB Floppy Drive
- *Mitsumi 101 Enhanced Keyboard
- *Microsoft Compatible Mouse w/ Pad
- *2HD/2FD IDE Controller w/2 Serials, 1 Parallel, 1 Game Ports
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- *Mitsumi 101 Enhanced Keyboard
- *Microsoft Compatible Mouse w/ Pad
- *2HD/2FD IDE Controller w/ 2 Serials, 1 Parallel, & 1 Game Port
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Logitech MouseMan Cordless	$89
Logitech Scanman 256 w/OCR 400DPI	$209
Microsoft serial mouse	$35*/$69
KeyTronic 101+ enhanced Keyboard	$35
Maxiswitch 124 Programmable keyboard	$59
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NEC 21" 6FG/5FGp 1280x1024 Flat	$2429/2529
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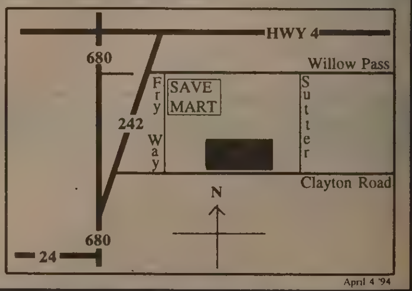

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Pentium P5-66/512K VLB	$1222	$1466(*)
Pentium P5-60/512K VLB	$1031	$1275(*)
486DX2-66/256K PCI	$629	$873(*)
486DX-33/256K PCI	$452	$696(*)
486DX2-66/128K ISA/VLB Intel	$490	$629
486DX-50/128K ISA/VLB Intel	$464	$597
486DX-33/128K ISA/VLB Intel	$320	$453
486DX2-66/128K ISA/VLB - AMD	$432	$565
486DX-40/128K ISA/VLB - AMD	$286	$418
486BL-75/256 IBM VLB w/Math-Co	$468	$712 (*)
486SLC2-66/64K IBM VLB w/Math-Co	$270	$403
486SLC2-50/64K IBM VLB w/Math-Co	$244	$377
486DX2-66/256K Genoa VLB	$541	$674
486DX-50/256K Genoa VLB	$508	$641
486DX-33/256K Genoa VLB	$364	$497
486DX2-66/256K NICE EISA VESA	$647	$780
486DX-50/256K NICE EISA VESA	$615	$748
486DX-33/256K NICE EISA VESA	$471	$603
486SX-25C VLB	$130	$262
386DX-40/128K ISA	$85	$218

SPECIAL BASIC SYSTEM

- Motherboard w/CPU+4MB RAM 70ns
- 1.2 and 1.44MB FDD
- IDE 2FD/2HD Controller w/ I/O 2S/1P/1G
- 120MB Hard Drive
- 1024x768 .28DP 14" SVGA Monitor
- 512K SVGA Card
- 101 Enhanced Keyboard
- Enhanced Case w/230 Watt Power Supply
- Microsoft Compatible Mouse+ Mouse Pad

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Pentium P5-60/256K PCI	1817
Pentium P5-66/512K VLB	1929
Pentium P5-60/512K VLB	1739
486 DX2-66/256K PCI	1327
486 DX-33/256K PCI	1150
486 DX2-66/128K ISA/VLB Intel	1200
486 DX-50/128K ISA/VLB Intel	1168
486 DX-33/128K ISA/VLB Intel	1023
486 DX2-66/128K ISA/VLB AMD	1136
486 DX-40/128K ISA/VLB AMD	989
486 BL-75/256K IBM VLB w/Math-Co	1166
486 SLC2-66/64K IBM VLB w/Math-Co	973
486 SLC2-50/64K IBM VLB w/Math-Co	947
486 DX2-66/256K Genoa VLB	1244
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+1.2&1.4 FD
+250MB HD
+SPiDER VLB w/1MB
+Viewsonic 6E monitor
+IDE VLB+mini case
+101Enhanced keyboard
+ Microsoft Mouse+Pad

$1490

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-Viewsonic 6E Monitor	45
-DIDO 14" Non-Int	110
-SPiDER BlackWidow 1M	110
-SPiDER 32VLB w/1MB	30
-Trident 1MB	20
-250 MB Hard Drive	45
-340 MB Hard Drive	80
-540 MB Hard Drive	210
-IDE VESA Localbus	10
-Medium case	25
-Full Tower	40
-Logitech Mouse	20
-Microsoft mouse	20

BASIC SYSTEM Includes: Motherboard &CPU, 1MB RAM, 1:1 2HD/2FD controller, w/ 1P/2S/1G, 1.2 or 1.44 MB FD, enhanced case w/Power supply, 101 Keyboard.

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245mb/15ms (IDE) Maxtor	212
250mb/14ms (IDE) Conner	212
260mb (IDE) Seagate	212
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420mb/12ms (IDE) Conner	265
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1.0 GB - 13ms (SCCI) Quantum	723
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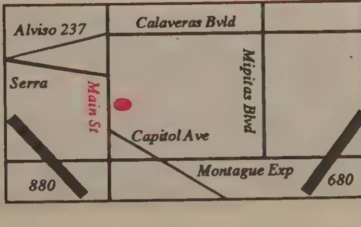

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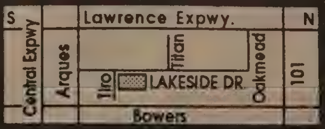

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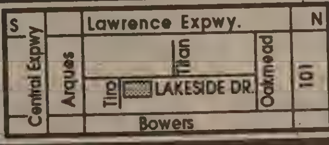

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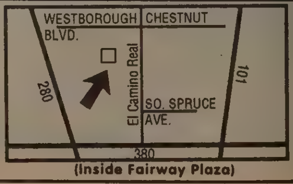

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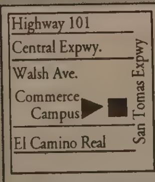

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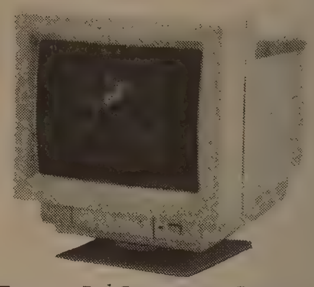

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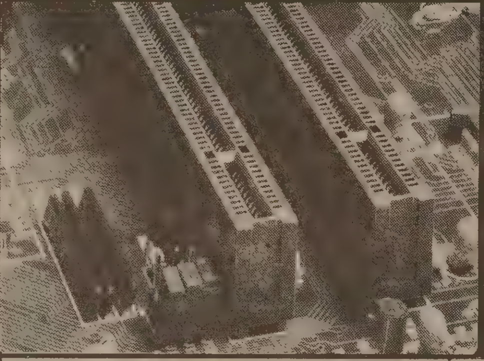

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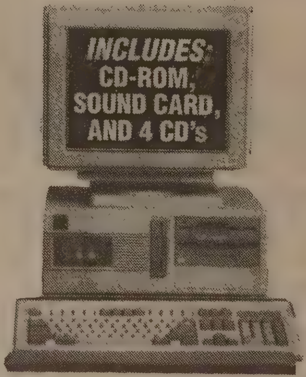

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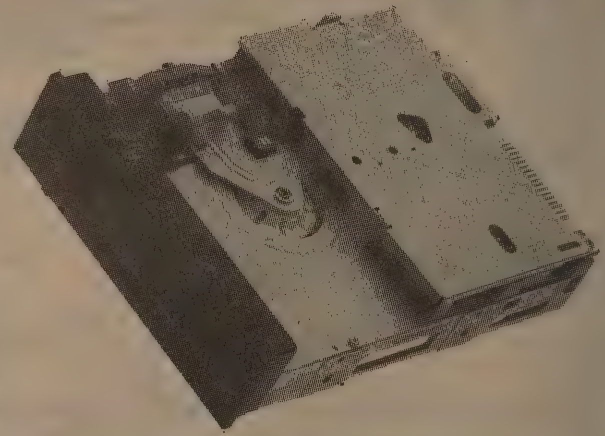

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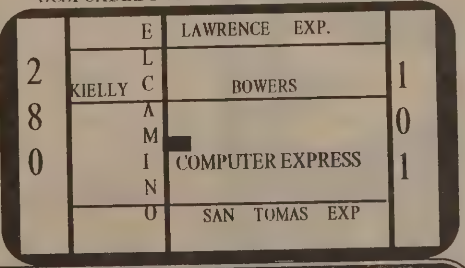

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Student/Home
Multi-Media System

i486SX-33 w/128K
Mini-Tower Case
4 MB RAM
IDE w/2SPG
1.44 MB FDD
DY 126 HDD
Trident 8900C 1 MB
14" SVGA .28 NI Monitor
Double Speed CD-ROM
SoundBlaster C Card
Speakers, Microphone
JoyStick
Educational 1 CD Bundle
KeyBoard, Mouse
MS DOS 6.2, WIN 3.1

$1,280

THE ROADRUNNER PCs - Value, Performance, Compatibility

System Pricing TYPE OF SYSTEM	BUS Structure	BareBone: Motherboard Mini-Tower Case IDE w/2SPG 1.44 FDD 101 K/B Serial Mouse	Complete Systems BareBone + 1 MB RAM SCSI 40MB HDD 13" VGA Col .28 Refurb 1 yr. War. VGA 256K Card	BareBone + 4 MB RAM IDE 80 MB (When Available) 14" Mono SVGA SVGA 512K Card	BareBone + 4 MB RAM IDE 170 MB HDD 14" SVGA .39 SVGA 1MB Card	BareBone + 8 MB RAM IDE 270 MB HDD 14" SVGA .28 SVGA 1MB Card +1.2 Floppy	BareBone + 8 MB RAM IDE 340 MB HDD 14" SVGA .28 NI SVGA 1MB Card +1.2 Floppy	BareBone + 8 MB RAM IDE 425 MB HDD 15" UVGA .28 NI SVGA 1MB Card +1.2 Floppy
HCL Pentium 60 MHz	PCI, EISA	$1,472					$2,429	$2,578
Pentium 60 w/256K	PCI, ISA	$1,304					$2,261	$2,410
A486DX2-66 w/256K	VLB	$617				$1,478	$1,536	$1,685
A486DX2-50 w/256K	VLB	$464				$1,325	$1,382	$1,531
C486DX-33 w/256K	VLB	$416			$1,019	$1,277	$1,334	$1,483
I486SLC2-66 w/64K	VLB	$390			$993	$1,251	$1,309	
i486SX-25	VLB	$307		$756	$929	$1,206	$1,264	
C486DX-33 w/128K	ISA	$395		$845	$996	$1,274		
i486SX-33 w/128K	ISA	$304	$637	$753	$905			
A386DX-40 w/128K	ISA	$211	$544	$660	$812			
A386SX-40	ISA	$181	$515	$631				

VLB Systems include VLB Controller and Cirrus Logic 5428 1MB VLB Graphic Card

Where available, upgrade any system to GREEN PC for $15.00 extra

CPUs: A - AMD; C - Cyrix; I - IBM; i - Intel

Bay Area On-Site Service Available

Business/Professional
Multi-Media System

C486DX-40 w/256K VLB
Med-Tower Case
8 MB RAM
IDE w/2SPG VLB
1.44 MB FDD
270 MB HDD
CL5428 1 MB VLB
15" 1280 x 1024 .28 NI
NEC Triple Speed CD-ROM
Pro Audio Spectrum 16
LabTec Speakers
KeyTronic K/B
LogiTech Mouse
MS DOS 6.2, WIN 3.1

$1,975

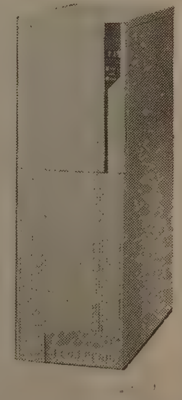
ASA... ...Proven Systems for all Applications

The THOROUGHBRED Workstations - Top-of-the-Line - Power, Functionality, Price

ARCHITECTURE	IBM	AMI - Intel	Intel(cs) - Intel	HCL - Intel	MIPS	DEC
Motherboard	Blue Lightening	Enterprise IV	CapricornP	Panther	SH-RISC	DEC
CPU	IBM 486BL3-75	Intel 486DX2-66	Intel Pentium P5 - 60	Intel Pentium P5 - 60	MIPS R4450 - 100	ALPHA
CPU Power (Mips)	22	21	42	42	56	_
Cache	256K - 512K	256K - 512K	256K - 1MB	256K - 2MB	512K - 2MB	_
RAM	16MB - 64MB	16MB - 128MB	16MB - 96MB	16MB - 160MB	16MB - 256MB	_
Exp. Slots	2 VESA, 7 ISA	2 VESA, 7 EISA	4 PCI, 4 ISA (1 Shared	3 PCI, 3 EISA, 3 ISA	2 VESA, 5 ISA	_
Drive Controller	IDE VLB Built-In	Adaptec VLB SCSI-2	PCI SCSI	PCI SCSI	32 Bit SCSI-2 Built-in	_
I/O	(2) 16550 S, P	(2) 16550 S, P	(2) 16550 S, P	(2) 16550 S, P	(2) 16550 S, P	(2) 16550 S, P
Video Card	Dia Viper 2MB VLB	Dia Viper 2MB VLB	ATI PRO 2MB PCI	ATI PRO 2MB PCI	GUI S3 1MB - 2MB	_
Video Power (Mws)	50	50	56	56	_	_
Operating System	MS Windows NT	MS Windows NT	MS Windows NT	MS Windows NT	MS Windows NT	MS Windows NT
Case	SuperT w/300W PS	SuperT w/300W PS	SuperT w/300W PS	SuperT w/300W PS	SuperT w/300W PS	DEC DeskTop
Price	$2,214	$2,848	$2,901	$3,097	$2,961	$Coming Soon

WorkStations Include: 1.2 and 1.44 MB Floppy Drives, KeyTronic KeyBoard, Logitech Serial Mouse

The Thoroughbred Workstations



Hardware platform for Multiple Operating Systems... and Applications demanding Workstation Power... AutoCad, P-CAD, Windows NT

The Thoroughbred Servers

Outstanding Price Performance and Functionality for Application and Networking Servers

MOTHERBOARDS & CONTROLLERS

ISA/EISA MOTHERBOARDS`

286-12/20	$37/55
386SX-40	$64

THE STALLION SERIES

ISA 386DX-40 w/128k	$92
ISA 486SX25/SLC-33	$137/101
ISA 486DLC-40&Math-co w/128K	$185
ISA 486SX33 256k	$195
ISA 486DX-33/40/50 256k Cyrix	$283/303/419
ISA 486DX-33/50 256k Intel	$353/509
ISA 486DX2-50/66 w/256k Intel	$380/543
ISA 486DX2-50/66 w/256k AMD	$320/475
EISA 486DX-50 w/256kIntel	$664

VLB/PCI MOTHERBOARDS`

486/P24T

PLEASE ASK FOR GREEN PC 486 MOTHERBOARDS

MustangF 486SX-25 ISA/VESA	$182
MustangS 486DX-33/50 W/256K Intel	$365/520
MustangS 486DX-33/40 w/256K Cyrix	$294/314
MustangS 486DX2-50/66 W/256K Intel	$391/554
MustangS 486DX-2 50/66 W/256K AMD	$331/487
MustangT486-33/50/66Intel	$401/557/591
IBM Alaris 486SLC2-66 wo/w Math-Co	$265/293
IBM BlueLightening 486BL3-75	$536
Micronix 486-33/50/66Intel	$586/742/776
AMI S Voyager 486-33/50/66Intel	$631/787/820
Pegasus N 486-33/50/66 Eisa/Vesa	$508/664/697
Micronix 486-33/50/66 Eisa/Vesa	$816/972/1005
AMI Ent IV 486-33/50/66 Eisa/Vesa	$754/910/944

PENTIUM P5-60 MHz

CapricornO 512K VLB 60/66Mhz	$1162/1420
Capricorn P 256K PCI/I 60/66Mhz	$1184/1442
HCL Panther PCI/E 256K 60/66	$1380/1638

` *(CPUs: A-AMD; C-Cyrix; i-Intel; I-IBM)*

ESDI CONTROLLERS

Ultra12F	$167
Ultra 12C 1/4MB	$270/386

RAID Controllers in Networking Section

ISA/EISA CONTROLLERS

IDE/MFM/RLL & FAST I/Os

Mustang IDE 2FD-2HD/4FD-2HD	$14/27
Mustang IDE w/ 2SPG	$15
Promise IDE Caching DC200 2FD/4HD	$104
Promise IDE Caching DC2032 2FD/4HD,IO	$151
Ultrastor 15C IDE Caching (upto 8MB)	$192
DTC IDE EISA/HFC RLL Card	$135/20**
UltraStor 22F Caching EISA	$340
FAST-PIG IDE,IO/IO w/16C550 Uarts	$43/28
ULTRA-IO 4S/3P 4 16C550 Bi-Dir	$124

SCSI

Future Domain Comp 16 bit	$50
Trantor T-130 SCSI Adapter	$60
ADAP 1522 16BIT Card/Kit	$71/142
ADAP 1542C Card/Kit	$184/249
ADAP 1542C+ Kit (w/Corel scsi)	$317
ADAP 1740A EISA SCSI-2 Card	$173
ADAP 2742 EISA Fast SCSI2 C/K	$319/361
Bus Logic BT747S C/KT	$340/497
DTC3290AS 7HD&4FD Caching	$441
Future Domain TMC1680 SCSI II C/K	$146/203
Ultra24F EISA SCSI Card/Kit	$325/349
Ultra 124 FEX 2 ch Int	$305
Ultra 124 FEX/3 3 ch Ext	$185
Ultra 124 FEX/5 5 Ch Ext	$347
AMI EISA SCSI II Cache w/wo PwrPk	$373/410
DPT Smart Cache 3 EISA SCSI	$331
Mylex DCE EISA SCSI Caching Ctlr.**	$228
Trantor348 Parallel Port to SCSI	$149

VLB/PCI CONTROLLERS

IDE

Mustang IDE/IO VLB/PCI	$21/33
Mustang FS IDE w/Fast IO w/OS2 drivers	$49
Mustang IDE/IO Cach 4-16MB 15.6mb/sec	$133
DTC 2277 IDE Caching	$111
DTC 2278 IDE / IO	$35
Promise DC-4030 4HD/2FD Caching	$121
Promise DC-420 w/512k IDE/IO	$104

SCSI

DTC 3270 SCSI I	$105
BusLogic BT445S Fast SCSI-II	$278
UltraStor 34F SCSI II 32k Card/Kit	$272/296
AMI SCSI II Caching wo/w Pwr Pk	$373/410
ADAPTEC 2842 SCSI II Kit	$294
National SCSI PCI Controller	$74

Cases - Power Supplies - KeyBoards - Mice

ROADRUNNER SERIES

Baby Desk/Mini Tower w/PS	$44/41
Medium Tower w/PS	$65
Full Tower(230W)/Big Tower(300W)	$78/143
Rack Mount W/PS	$290

DIAMOND SERIES (For Black add $5)

Baby Desk/Mini Tower w/PS	$71
Medium Tower Slim/Thick w/PS	$81/97
Full Tower w/PS	$112
File Server w/ 400W PS, 3 Fans 12 F/HDD	$446

External HDD/CD-ROM Cases

1HH w/PS 3.5"/5.25"	$65/73
1FH(2HH)/2FH(3HH) w/PS	$91/132
Removable IDE chasis & carrier	$49
SCSI Cables Int/Ext	$10/11

For Un-Interruptible Power Supplies see UPS's in Networking Section

KEYBOARDS AND MICE

Regular/Spill-Resistant 101	$16/17
MaxiSwitch/KeyTronic	$29
Small 11.5" 88 Keys/**BLACK 101**	$31
Russian/Japanese Keyboard	$21/53
KeyBoard w/Trackball Small/Big	$44/79
SEJIN J-Mouse (mouse under 'J' Key)	$95

Also line of European/Arabic KBs

S-Mouse/TBall	$9/20
LogiTech Ser/Bus bulk	$18/39
LogiTech Mouseman Cordless	$82
Microsoft white box S/B	$30/54
BLACK SERIAL	$23

POWER SUPPLIES

PS2 200/300W	$34/73
PS2 200W **GREEN PC**	$45
Full Tower 230/300/400W	$49/63/143

MASS STORAGE PRODUCTS

FIOPPY DRIVES

YE Data 1.2/1.44MB	$45/36
Teac 1.2/1.44MB	$50/40
Teac Dual Floppy 1.2 + 1.44 MB	$107
Toshiba 2.88MB wo/w controller	$59/86

FLOPTICALS

IOMEGA 21MB w/1 Disk, Cable	$419
YE-DATA 21MB w/5 Disks	$392

HARD DRIVES

2.5" NOTEBOOK DRIVES

QUN 127 /256MB 16msec	$225/339

IDE

(Hard drive prices change often-please call)

QTM 80 19 msec (when available)	$149
Dae Young 120 MB (when available)	$154
QTM 127MB 17 msec(when available)	$179
MXT130 18ms	$179
CON/QTM 170MB 17 msec	$189
CON 210 14msec	$202
WD 212 12msec	$209
ST 214/260MB	$199/229
CON/WD250MB 14msec	$224
QTM 270/MXT 245MB 15ms.	$229
WD 340/MXT 340MB 12/14 ms	$275/273
CON/QTM 340MB	$269
CON 425MB	$297
WD 425MB 13msec	$302
QTM 540MB 11msec	$425
MXTR/WD 540 12msec	$399/459
CON 540MB 12msec	$419
MICROPOLIS 1/1.8GB 10ms	$829/1175

SCSI - 3.5"

QTM 42MB SCSI	$69
CON/QTM 170MB 17msec	$199
MXT 245/QUN 240MB 11msec	$249
MXT 340MB 15 msec	$369
CON 340MB 13msec	$358
QUN 540MB 11 ms	$458
MXT 540MB/CON 540 8/12 ms	$575/489
FUJ 1.2GB 10msec 5 year	$810
DEC 3107 1.07GB,9 msec	$822
MXT 1.2GB 8 msec Magix	$1220
MICROPOLIS 1/1.8GB 10ms	$829/1179
HP1.2GB 10.5msec	$825
ST1.2GB ST31200N 9 msec.,1"high	$790
ST12400N ST2.1GB 9MS	$1449

SCSI - 5.25"

HP 1.6GB/2.4GB 11.5 msec	$1610/1792
ST41600N1.7GB 11 msec Elite I	$1715
Fuj 2.4GB 12 msec	$1345
ST42100N 2GB 13ms Wren	$1489
ST42400N 2.5GB 11msec EliteII	$1695
ST43400N 3.5GB 11msecEliteIII	$2212

SUPER HARD DRIVES

Seagate Barracuda 3.5" HH (8 msec avg. seek, 4.17 msec lat., 7200 RPM)	
ST11950N/ST12550N 1.7/2.5 GB	$1875/1995

FLASH CARD HARD DRIVE

ST 75A 1.8" 5.2MB IDE<1.5MS	$484
ST 710/720A 1.8" 10.4/20.9MB	$888/1177
ST 740A 1.8" 41.9MB IDE<1.5ms	$2068

EXTERNAL HRD. DRV. SUBSYSTEM

FOR EXT. HARD DRIVE,	ADD $99

TAPE DRIVES

(<500MB TAPE-BACKUPs)

Colorado 120 / 250MB	$99/169
Conner 250MB Int w/tape	$155
Colorado KE-10 Ext.kit w/card/card only	$105/37
FC-10 high perf card	$85
Colorado Trakker 250MB	$329
Archive 250MB w/QIC,150MB/min,1"H	$146
Archive Viper 250MB hh SCSI I/E	$335/425

(>500MB for PC / SERVER)

Viper 525MB hh SCSI Int/Ext 6MB/sec	$440/530
Archive Anaconda 1.3GB Int. SCSI 5.25"	$868
Conner Tapestor 1.36 DC6000 Int. SCSI 5.25	$825
Mountain 2/4GB Filesafe Int Dat 4mm	$1629/1959
Archive 4320 NT 2.0GB DAT 3.5"	$829
Archive 4324NT 4.0GB TURBO DAT 3.5"	$1075
Colorado 2.4 / 4.0 GB Qic 5.25	$929/1499
HP 2GB DAT 4mm Int/Ext	$970/1060
HP 4-8GB DAT 4mm Int/Ext	$1119/1199
WANGDAT 3100 2.0GB 4mm Int/Ext	$889/989
WANGDAT 3200 4-8GB 4mm Int/Ext	$1099/1199
EXABYTE 750MB HH MINI Int/Ext	$692/860
EXABYTE 8205 5GB HH Int/Ext	$1595/1695
EXABYTE 8505 10GB HH Int/Ext	$2339/2505

(above drives require special contr & soft drivers)

TAPE BACKUP DRIVERS

Novaback for DOS//OS/2	$65
Novanet Multiuser NLM	$279
ARC Serve Solo	$175
SYTOS for DOS/NOVELL, GEN	$120
Conner Backup Exec for Dos/Win v3.3	$79
Conner Backup Exec for Netware v3.1	$259

MAG/OPTICAL (Rewritable)

TEAC 128MB 3.5" Int/Ext	$625/729
PinnacleTahoe 130 portable 3.5"Opti w/inter	$999
IBM 127MB 3.5" Int/Ext	$833/943
Panasonic LF-7010 1GB 5.25	$2799
HP 1.3GB 5.25" SCSI-2 EXT	$2799
MAXOPTIC 1GB Tahiti IIM 35msec	$2260

REMOVABLE DRIVES

Syquest 44MB Dr.	$249
W/Ext Case, Cables, Cart, Cont	$379
Syquest 88/105MB Dr.	$308/389
Bernoulli 44/99 Insider	$907/840
IDE: Upto 1GB removable kits	$39
SCSI: Upto 1GB Removable Kits	$138

DISKETTES & CARTRIDGES

Floppy 1.44 Bulk	$.49
Floppy 1.2 Bulk	$.44
Tape DC2120 250MB..Formatted	$16
Tape DC 6250 5.25", 1/4" Cartridge	$25
Tape DC 6525 5.25", 1/4" Cartridge	$30
TK50 for DECs	$24
DAT 4mm 90 mtr HP/OEM	$20/14
DAT 8mm 112 mtr	$14
Syquest 44/88/105MB Cart	$?
Bernoulli 44MB/90/105MB 3Pk	$289/298
Mag-Opt 600MB/650MB 5.25"Rewrite	$98/98
Mag-Opt 1.2/1.3 Rewritable	$124/124
Mag-Opt 600/650MB Write once	$98/98
Mag-Opt 1.2/1.3 GB Write once	128/128
Mag-Opt 128MB 3.5"	$58
Mag-Opt 650/1.3 GB WORM 5.25"	$160/193

VIDEO ADAPTERS & MONITORS

ISA/EISA ADAPTERS

MGP	$13
VGA 256k	$28
Trident 512K/1MB	$40/60
Tseng 1MB	$76
Mustang 1MB Window Accel	$68
Diamond Stealth 24	$146
Fahrenheit 1MB	$143
Hercules Dynamite Pro 1/2MB	172/225
Hercules Graphite Pro 1/2MB	$274/418
ATI Ultra Grpx 1MB w/Mouse	$214
ATI Ultra 8514 1 MB	$210
ATI Ultra Pro 2MB (no mouse port)	$294
Genoa 7900 w/1MB	$95**
Genoa 8560 w/ 1MB	$171**
Genoa 6200	$36**
ATI Ultra Pro EISA 2MB	$316
AMI Fast View w/2MB Weitek P9000	$call
AMI Fast View EISA VGA Graphics w/1MB	$call

VLB/PCI ADAPTERS

(wm = winmark ver2.5)

MustangVT Trident 1/2MB	$70/115
MustangVC Cirrus Logic 5428 1/2MB	$81/126
Spider 32 1MB/2MB,20 WM	$92/135
Spider 32 Plus 1MB/2MB	$98/145
Spider Blk Widow 1/2MB 54 WM	$188/253
DIAMOND Stealth 24vlb 1MB	$148
DIAMOND Stealth pro 1/2MB vram,36wm	$255/316
DIAMOND Viper 2MB,9000,50wm	$367
ORCHID Fahrenheit S3-805,1/2MB	$143/193
ORCHID Celsius 1/2MB	$216/266
ORCHID Kelvin 1MB	$164
Hercules Dynamite Pro 1/2MB	172/225
Hercules Graphite Pro 1/2MB	$274/418
ATI Ultra Pro 2MB, 26wm	$305
Cirrus Logic 5428 1/2MB PCI	**$132/188**
ATI VRAM 2MB PCI	**$333**
DIAMOND VIPER 2MB PCI	**$389**

CAD SPECIALITY ADAPTERS

NUMBER NINE - #9GXI/GXE

L10 ISA/VLB	$249
L11/I12 S3928, ISA&VLB	$369/436
L14 ISA	$659
64-1MB PCI or VLB/2MB PCI or VLB	$196/267
L23 WIND/ACAD,T34020,1280,16C	$975
L25F,40MHZ,WIN/ ACAD,,1280,256C	$1255
L29 T34020,1024X768X16.7M Color	$1379

MATROX

MGA-2VLB/plus/Ult 2/AH	$458/529/537
MGA-IMP 3AH/V	$758
MGA-PRO 4.5V/4.5+z buffer	$1139/1435
MGA-PCI 2/2 Plus	**$462/530**
MGA-PCI 4/4-200	**$744/968**
2MB MGA Upgrade	$234

METHEUS CORPORATION

Premier 928 VL2(1MB)/4(2MB)	$324/559
Premier 928 ISA 1M/2M/4M	$297/422/725
MODULE 1MB Memory	$119
1104 Plus 256 Hz, MultiDisplay	$1295
UGA 1228Hz 256, 60/74Hz	$1895/2095

(We do not have the high end CAD adapters and monitors on display and carry only a few in stock - these are on Just-In-Time inventory basis - please place orders in advance-the prices in parenthesis are on a cash basis only)

9" - 14" MONITORS

MONO

Mono 14" amber/white	$83
Mono 9" VGA/14" SVGA	$106/102

VGA/SVGA

VGA IBM 8513 13" .28 refurb 6 mon	$154
SVGA 14" 1024 x 768 .39	$193
SVGA 14" 1024 x 768 .28 Int	$221
SVGA 14" 1024 x 768 .28 NI	$232
Black 14" SVGA 1024 x .28 I/NI	$293/326
CTX 14" 1024 x 768 .28 Int.	$248
CTX 14" 1024 x 768 .28 NI	$267

CAD MONITORS

Miscellaneous

Darius 15" .28 1280xNI	$359
KANAKA 15" Hitachi Tube 1280x1024.28	$349
Sony 1604s OEM	($835)$870
KFC 15/17"1280NI .28/.26	$369/$749
Mitac 17" 1600x .26 3yr warranty	$764
Mitsubishi 15FS DiamondScan	$495
Mitsubishi 17FS DiamondScan	($999)$1039
Mitsubishi 17 DiamondPro	($1065)$1099
MAGNVX20CM64 20", 1280, .31.	($1210) $1250

NANAO

F550i 17", .28,1024NI MPR2	($969)$999
F550iw17",.281280NI MPR2	($1156) $1189
T560i 17",.25 1280NI, MPR2	($1363) $1399
T560iw,.26 1280NI,MPR2 Promo	($1363)$1404
T660i 20",.30 1280NI MPR2	($2379) $2459
F760iw21".31,1280NI,MPR2	($2159) $2249

NSA-Hitachi

CM1797 17`.28.1280NI,MPRII	($1193)$1237
CM2095 20" 1280 Anti Glare	($1299) $1355
CM2087 20" 1280 72Hz Mic	($1626) $1685
CM2187-515 21" .28 1280NI	($2069) $2144
CM 2188 21" .28 1280NI	($2435)$2525

Hitachi America - ACCUVUE

PS-20,.31dpi 1600x NI	($1599)$1665
PS-21,.28dpi 1600xNI	($2093) $2170
PS-21A,.28dpi 1600xNI	($2325)$2399
PS-21.28dpi 1600xNI Mic	($2435) $2525

Sony

CPD1430s 14" 1024NI .25	($539)$555
CPD1730 OEM 1024NI .25	($889)$899
CPD 1730 Original 1024Ni,.25	($1029)$1059
GDM17SE 17" 1600NI .25	($1189)$1224
GDM2036S 20", .1280NI,.30	($1999) $2069
GDM2038 20",1280NI,.30	($2259) $2339

Nokia

15" 449E,.28 1024NI	($537)$557
17" 447B Trin.25dpi,1280x	($977)$1005
21"445M.26,1280NI	($2068)$2139
21"445X.26,1600NI	($2685)$2785

Sampo

Sampo KDM1767 17" .28	$718
Sampo 1777 17" .28 Microp&Hitachi tube	$809
Sampo 2055 20" .31	($1050)$1090
Sampo KDM2077 20" NI 1280 .31	($1475)$1528

NEC

3V/4FGE	$535/($679)$699
5FGE/FGP17", .28,	($1068)$1109/($1189) $1223
6FGP21",.28,1280NI	($2137)$2215

MAG

LX1564 15" .28, 1280NI	($395) $405
MX15F 15"MPR II	($505) $515
MX17F,17".26,1280NI,Mic Org	($895) $905
MX17FG,17".26,1280NI,	($905)$915

AT ASA...

...WE DELIVER

NATIONAL: 1-800-REAL-PCs

SILICON VALLEY: 1-408-PCs-FOR-U

MICRO MARKETPLACE

MULTI MEDIA

CD-ROMs

IDE TYPE CD-ROMs

CD-ROM-#1-of-the-Month
Mitsumi Kit 350msec, 150 KB/S.........**$115**

Panasonic 562 DblSpd.320ms, 300kb/sec	$171
Mitsumi Dbl-Spd 250ms,300kb/sec	$165

Super Multi-Media Complete Kit on Sale!
Mitsumi CD-ROM, 150KB/sec, 350ms
8 bit Sound Blaster Compatible Card (for Win)
Quickshot Warrior joystick
Shielded PC spealers
Deluxe model microphone
Award winning Apogee sound-supported
games; all for.................**$179!!!**

SCSI CD-ROMs

NEC 3X CDR-510 Ext 195ms,450KB/sec	$456
NEC 3XP Portable 250ms,450KB/sec	$475

CD-ROM-#2-of-the-Month
NEC 3X CDR-510 Multispin, 195ms,450KB/sec
......**$361**

TOSHIBA 3401B/E 200ms, 300kb/s I/E	$316/459
Texel 3028/5028 240ms, 335kb/s I/E	$265/419
SONY CDV561, 295ms, 300kb/sec	$286
Microsolution,350ms,Parallel port	$339
Future Domain SCSI CD-ROM Kit	$69

AUDIO CARDS & MPC KITS

Hyena Snd Blster Comp. 8bit Sound Card	$39
Hyena w/ Speaker, Joystck, mcrphn, games	$53

MEDIA VISION

Pro Audio 16 Basic	$102
Pro Audio Spectrum 16 ORG/OEM	$124/114
Pro Audio Studio 16/Power Pack	$199/69
Fusion Double CD16 Kit Int/Ext	$485/495
Pro 16 Multi-Media System/II	$609/764
Pro Movie Spectrum/Studio II	$279/309

CREATIVE LABS

Sound Blaster Deluxe 8bit	$67
Discovery 8/16 Upgd. Kit	$389/459
Edutainment 8/16 Upgd. Kit	459/499
SoundBlaster 16 Basic/SCSI 2	$135/188
SoundBlaster 16 ASP SCSI/MCD	$212/194
Sound Blaster Voice Editor	$55
Wave/Video Blaster	$179/305

MISC MULTI-MEDIA PRODUCTS

Quickshot Warrior joystick	$15
Sheilded speakers	$17
Deluxe model microphone	$19
Logitech Fotoman Digital Camera for PC	$465
Logitech SoundMan 16	$109
Intel Smart Video Recorder	$520
Cardinal Tech Digtl Sound Pro 16/Plu	$145/186
Video Logic Captivator Kit win3.1	$369
Midi Mate/CDPC XL	$49/1059

PLOTTERS, DIGITIZERS, SCANNERS & PRINTERS

PLOTTERS

HOUSTON INSTRUMENTS

HI 1117 A/B size,8 pen	$665
V50 INKJET A-C,2MB BUFFER	$1529
HiPlot 7100 A-D 8 pen,LCD display	$2659
HiPlot 7200 A-E 8 pen,LCD display	$3489
DMP-162R A-E, 8 Pen, Roll Feed	$4475

DIGITIZERS

SUMMAGRAPHICS

III 12x12 w/16btn or 4bt & Pen	$299
III 12x18 w/16btn or 4bt & Pen	$549

KURTA

XLP 12x12 w/4btn & Pen	$235
XLP 12x18 w/16btn or 4btn & Pen	$449
IS/ONE 12x12 single cursor	$295
IS/ONE 12x12 two cursor or 12 btn	$313
IS/ONE 12x17 single cursor	$489
IS/ONE 12x17 two cursor or 12btn	$509
XLC 36x48 w/16btn or 4btn&pen	$1550

CALCOMP

CALCOMP 12 X 12/12 x 18	$289/639
CALCOMP 18 X 24	$1285
CALCOMP 6 X 9/12 x 12 P Series	$449/495

SCANNERS

LOGITECH (HAND-HELD)

SCANMAN-COLOR w/Phototouch	$449
SCANMAN 256GS wo / w OmniPage	$159/205
SCANMAN 32GS w OmniPage	$142
SCANMAN EASY TOUCH	$225
Dexa Scanner 32GS/256GS	$115/155

MICROTEK

SCANMAKER II/IIXE 600dpi w/OCR	$669/1039
Scan-in-Dex Business card scanner	$285
SCANMAKER 35T Slide,1800dpi,w/Photo.	$1429

MUSTEK(Hand-held)

ScanMagic256,400dpiw/perceive	$119
ScanMagic Color,400dpi,256 grays w/perc	$225
GrayArtist,800dpi,256 grays w/perc	$169
Colorartist Pro,800dpi,256&colr w/per	$325

MUSTEK (Flatbed)

MFS-6OOOCFB 600dpi,16mill clr,w/Perc	$685
Paragon 600(dpi)24 bitclr,Photoshop	$665
Paragon1200(dpi)24 bitclr,Photoshop	$1149

(Mustek scanners come with proprietary cards)

UMAX

UC 630 PC,600dpi max,24bit /256gray	$759
UC840,800dpi max,16.8 million clrs	$1035
UC1260,1200dpi max,16.8 million clrs	$1549
UC1200SE,1200dpi max.,30 bitclrs	$2785

(Umax's are 8.5"x14"& come with 8 bit scsi cards)

EPSON

Action Scning 300dpiw/PicturePublLE&card	$875
ES-800C Pro 400dpi w/Picture Publ&scsi	$1375

Miscellaneous

LeoScan 610 sheet feed,300dpi/256 gray	$599
HP 2Pgrayscale/2cxcolor 300/400dpi	$779/1059
Fujitsu M3096G 11.7x17" scsi2 interface	$4500
Tamarack 6000/8000C 300/400dpi	$729/853
Westbrook File Majic OCR for hi-end scners	$285

PRINTERS

Miscellaneous

Star Micrnix NX1001 9 Pin.120/220V	$134/144
Star Micronix 220v quantity of 100 only	$135
IGOR 132 9Pin Wide 220V (Cyrl..).In stock.......with any purchase	**$110**

EPSON

LX810 9Pin dot matrix,3 res. fonts,4k	$183
Action 2250 9 pin,50sheet,240cps	$127
LQ 570+ 24 pin Wide, 269 cps, 11 fonts	$260
LQ 1070+ 24 pin Wide,252cps,11fts	$408
LQ 1170 9pin Wide,2 resident fonts... ($664)	$676
Stylus 300 Inkjet 360dpi,150cps	$252
Stylus 800 Inkjet 360dpi,150cps,100sht	$298
Action Laser 1000 300dpi,6ppm,512k	$699
ActionLaser 1500 300dpi,6ppm,1mb.($678)	$735

CANON

BJ 200/230,360dpi,49k,7fnts,4ppm	$309/399
BJ10SX,110cps,360dpi,**Portable**	($269)
BJC 600 Color,240cps,360dpi,100sht($599)	$649
BJC 820 Color,240cps,4ppm,1MB.($1615)	$1635

OKIDATA

OL 380dot mtrx, 24 pin, narr., 6 fnt, 23K	($219)
OL400e/410e laser, 4ppm	($525)$539/($687)
OL810, 8ppm, 300dpi	($955)$964
OL830 Plus, 8ppm w/ 2MB post script	$1189
OKI ML184T dot matrix, rugged industrial	$229
OKI ML320 320cps 9pin/ML520	$315/$392
OKI ML590/ML591 24 pin, 64K	$460/($599)

PANASONIC

KX-P2123/KX-P2624	$255/$420
KX-P2124, N-Carr, 320cps, 360dpi, 12fnts	$335
KX-P1624, W-Carr, 192cps, 360dpi, 14fnts	$415
KX-P4410,5ppm,300dpi,28fnts,512k	$599

CITIZEN

GSX145 24pin wide, 160cps, 360dpi	($359)
GSX200 9 pin, narr/wide	$168
GSX220 24 pin	$184
GSX230 24 pin.8 fonts, 360dpi, 270cps	$249
(color option for Citizen 80 col printers	*$45)*
GSX240 24 pin, nrw 300cps, 13 fonts	$315
Notebooks CTZPN48/CTZNP-IBM	$284/326

HEWLETT PACKARD

Deskjet 500 Inkjet300dpi,120cps,16k	$275
Deskjet310 3ppm, 300dpi, 6bitmap	$379
Deskjet 500C Color 300dpi,167cps 16k	$409
Deskjet 560C Color,3ppm,300dpi,80k	$599
Deskjet 1200C Color,300dpi2MB...$(1475)	$1523
HP4/4P/4Si/4L	($1475/975/2995/695)
4M/4ML/4MP/4SMiX	($1995/$1045/$1430/4550)

NEC

Pinwriter3300 24pin wide,360dpi,80K	$353
Pinwriter6200 24pin narrow,360dpi,80k	$442
Pinwriter9300 24pin wide.360dpi 333draft	$940
Silentwriter superscript610,6ppm,256k	$633
Silentwriter95FX built-in fax,2MB...($1199)	$1221
Silentwriter1097 600dpi,7mb.....($1505)	1533

FUJITSU

10 Laser,10ppm,1mb 14fonts	$840
10W Laser,10ppm,2mb,35fonts	$952

MEMORIES, MATH-COs & CPUs

MEMORIES for IBMs

SIMMs

256 x 9 (3 chip)-70NS	$14
1M x 9 (3 chip)-70 Major brand	$42
1M x 9 (3 chip)-70NS mixed brand	$40
1M x 9 (9 chip)-70NSMajor brand	$47
4M x 9 (3 chip)-70	$155
4 x 9 (9 chip)-70NS	$165
1M x 9 (3 chip)-60 Major brand	$46
4 x 9 (9 chip)-60NS	$170

ESIMMs(72 Pin)

256x36-70NS	$65
512x36-70NS	$104
1x36-70NS	$158
2x36-70NS	$335
4x36-70NS	$670
1x36-60NS	$168
2x36-60NS	$340
4x36-60NS	$675

SIPPS

256x9 (3 chip)-70NS	$16
1x9 (3 chip)-70NS	$46
1x9 (3 chip)-60NS	$49

DRAMs

1x1-70/80NS	$5.75/5.25
256x1-70/80NS	$1.75/1.60
256x4-70/60NS	$6.00/6.50

MEMORIES for MACs

MACINTOSH

1x2chip-70/80NS	$44/38
1x8chip 70/80NS	$46/43
2x8chip 70/80	$94/89
4x8chip-60/70/80NS	$154/145/139
16x8chip-70NS	CALL

APPLE UPGRADES

Centras & Quadra 600 series

256x32-70NS	$43
512x32-70NS	$82
1x32-70/80NS	$139/137
2x32-70NS	$284
4x32-70NS	$515
8x32-70NS	$1189

QUADRA 800 SERIES

512x32-60NS	$85
1x32-60NS	$143
2x32-60NS	$279
4x32-60NS	$649
8x32-60NS	$1298

POWER-BOOK SERIES

Please call for latest pricing

CACHE RAMs

32x8-20	$6.90
64x4-20	$7.50
8x8-20	$3.90
16x4-20	$3.95
64x1-20	$6.90
128x8-25	$39
32x8-15	$8.20
64x4-15	$9.80
8x8-15	$4.40
16x4-15	$4.95
64x1-15	$8.85
128x8-25	$49

CPUs & CPU FANS

INTEL

386 DX33	$55
486 DX 33	$276
486 DX 50	$430
486 DX2 50	$298
486 DX2 66	$459
Pentium 60MHz	$828
Pentium 66MHz	$1040

AMD

386 DX 33/40	$50/53
486 DX 40	$250
486 DX2 50	$240
486 DX2 66	$395

CYRIX/TI

486 DLC 33/40	$75/85

CPU Fans

486 heat sink and fan	$8.95
Pentium heat sink and fan	$15.50

MATH-COPROCESSORS

INTEL

80387 SX 16/20/25	$45/64/75
80387 DX 16/20/25/33	$35/40/45/80

Overdrives - call for latest prices

IIT

3C87SX-16/20/25	$39
3C87SX-33	$39
3C87DX-25/33/40	$39

CYRIX

83S87SX 25	$39
83S87SX 33	$39
83D87-33	$41
83D87-40	$48

WEITEK

4167-25	$265
4167-33	$425

LASER EXT. MEMORIES

HEWLETT-PACKARD

HP IIP, IIP+,III,IIID,IIIP	1/2/3/4MB	$78/119/158199
HP II, IID	2/4MB	$127/204
HP IIISi	1/4MB	$79/208
HP IV	4/8MB	$169/369
Deskjet 500, 500C, 550C	256K	$98

PANASONIC

KXP 4410/20/30	1/2/3/4MB	$102/152/179/219
KXP 4450	1MB	$139
KXP 4455	2MB	$168

OKIDATA

OKI 400	1/2MB	$98/119
OKI 800/820	2/4MB	$127/196
OKI 810	1/2MB	$115/192

EPSON

Epson 6000	2/4MB	$138/209
Epson 4000/8000	1/4MB	$136/219
Epson 7000	2/3MB	$128/178
Action laser II	2/3/4/5MB	$128/148/189/221

Special Terms and Conditions for this Section: CPU and Memory prices are changed on a daily basis; please call for the latest prices. These products when bought without systems may come with a shorter warranty - please enquire. We do not stock many of the above products - please call for availability&quantity discounts.

SOFTWARES

For Networking, Communications, Tape Storage Drivers, Networking Drivers, Multi-Media and Speciality Softwares also look in the corresponding sections.

UTILITIES

Norton Utilities V 7.0/Anti-Virus v2.1	$116/89
QEMM 386 V7.0	$69
AfterDark V2.0 WIN	$29
PC Tools V 8.0A	$57
Auto-Doubler/Disk-Doubler	$68/61
LapLink V5.0 FOR NETWARE	$74
MickyMouse/StarTrek Screen Saver	$39

DESKTOP PUBLISHING & GRAPHICS

Corel Draw V4.0/UPGRADE	$383/218
Pagemaker/WIN V5.0	$598
Harvard Graphics For Windows	$248
Norton Desktop WIN V2.2	$115
Micrographx Graphics Works	$158

DATABASES

Accesss for Windows	$145
CA-Clipper V5.2	$512
DBASE IV V2.0	$513
FoxPro For Win/DOS 2.5 Upgrade	$300/305
FoxPro LAN	$call
Paradox V4.0/WIN	$524/145
Q & A 4.0	$243
Superbase 2.0 WIN	$345
LOTUS SMARTSUITE	$448
Gupta SQL router/SQL server	$166
Gupta SQL for DOS	$2597
Gupta SQL gateway for netware	$3252

ACCOUNTING

CA-Accpac BPI Integrated	$148
CA-Acc. Simply Accounting DOS	$79
DAC Easy Accounting/Payroll 4.3	$94
Works for WIN 2.0	$129
MS Project 3.0 for WIN	$425

SPREADSHEETS

LOTUS WORK V3.0	$99
MS Excel V5.0	$292
MS Works for WIN	$123
Quattro Pro V 5.0 WIN/DOS	$54

WORD PROCESSING AND GRAPHICS

AMI Pro 3.1	$240
Grammatik	$73
Professional Write V 2.2	$159
MS Word 6.0 for DOS/WIN	$305/299
Word Perfect for DOS/WIN	$119/294
WordStar 7.0	$264

COMMUNICATIONS

Procomm Plus 2.01/WIN	$70 /97
WinFax Pro V 3.0 for WIN	$99
Norton PC Anywhere 4.5 Host/Rem	$65/86
CrossTalk for WIN	$129
Win for Workgroup v3.11 Add-on	$64
Winfax Pro Network Kit	$239

PROGRAMMING LANGUAGES & OPERATING SYSTEMS

M.S. DOS 6.2/UPGRADE	$48
M.S. Windows V 3.1	$63
DESQView /x V1.1	$ 163
Windows NT 3.1 /UPGRADE	$314/278

ACCPAC plus AUTHORIZED DEALER

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NATIONAL: 1-800-REAL-PCs

SILICON VALLEY: 1-408-PCs-FOR-U

COMMUNICATIONS

FAX-MODEMs

PONYX 902Z 96/24 Fax (Send)/Mod Int	$27
PONYX 992Z 96/24 Fax/Modem	$42
PONYX 992NZ 96/24 F/M, v.42 bis Enh	$55
PONYX 1414IZ 14.4 F/M,.32/.42 Int	$98
PONYX 992PZ **Pocket** 96/24 F/M,.32/.42	$63
PONYX 1414PZ **Pocket** 144 F/M, v.32, v.42	$184
PONYX 992MG **PCMCIA** 96/24 F/M v.42	$132
PONYX 1414MG **PCMCIA**144/144 F/M v.42	$244

AT&T Paradyne

DataPort 14.4 Fax V.32bis External	$175
Comsphere 19.2/14.4 Fax V.42bis Int	$565
Comsphere 19.2/14 4 Fax v.42bis Ext	$675
Keep in Touch **PCMCIA** 14.4 S/R Internal	$299

US ROBOTICS

9600 Sprtstr Modm V.32 V.42bis I/E	$128/139
9600 Sport Mod/fax V.32 V.42bis I/E	$135/146
14,4 Sport Mod V.32bis V.42bis I/E	$139/151
14,4 Sport Mod/Fax V.32b V.42b I/E	$144/157
14,4 Mac&FAX Ext. Mod/fax	$182
14,400 HST Courier Dual V.32bis	$742
Modem Sharing Single/Dual Kit	$584/964
World Port **PCMCIA** 14.4 Mod/fax Int	$305

INTEL

14.4 Fax/Modem Winfax Int./Ext	$154/174
Satisfaction 100/200/300Fax Int	$115/219/229
Satisfaction 400 14.4 S/RFax Int/Ext	$279/329
96/24 **PCMCIA** Internal	$199
96/96 **PCMCIA** S/R Internal	$259
14.4 **PCMCIA** S/R Internal	$299
Net SatisFAXtion v2.5 20 User	$619
Wireless Modem for Lan Microsoft mail	$659
Wireless Modem for Lan based server	$699

NATIONAL SEMI-CONDUCTOR

TYIN2000 Fax,Mod,Answer M/C,Audio Play	$125

THE COMPLETE PC

Communtr EZ Modem/Voice/Mail.Int/Ext	$85/109

ZYXEL

U-1496B 16.8/14,4 VoiceFax SW,S/R Int	$298
U-1496B+19.2/14,4 Voice Fax SW,S/R Int	$419
U-1496E 16.8/14.4 VFax SW,S/R LED Ext	$295
U-1496E+ 19.2/14.4VFaxSW,S/R LED Ext	$415
U-1496+ 19.2/14 4VFaxSW,S/R LCD Ext	$619
U-1496+19.2/14.4 S/R LCD **MAC** Ext	$659
U-1496E+ 19.2/14.4 S/R LED **MAC** Ext	$429

MOTOROLA	$CALL

PRACTICAL PERIPHERALS

14.4 Fax/Modem S/R Internal	$164
14.4 Fax/Modem S/R External	$180

WHITE PAPER FAX

Converts any Laser Printer to a White Paper Fax Machine; avoid use of expensive ribbons. 20 page Memory. Ideal for heavy through-put.

.......$249

NETWORKING PRODUCTS & SERVICES

ETHERNET ADAPTERS

NE 2000 Plus Comp 16bit Coax/10BT	$40
NE2000 Plus Comp Combo soft/hard config	$42
D-Link 16 Bit.SoftConfig. 10BT 1/6 Pack	$70/377
Intel EtherExpress 16/5pk/20pk	$104/479/1815
Intel EtherExpress 16 MCA/16 MCA TP	$171
Intel EtherExpress 32 EISA/Flash	$419/239
Intel EtherExpFlash C/5pk/20pk	$124/549/2059
SMC Ethcard 16 UltCx/6 Pk/24pk	$109/574/2149
SMCEthcard Elite Ultra 1/6/24pk	$112/609/2222
SMCEthcard+Elite16 Cx/TP1/6/24	$119/615/2289
3 Com 503 Etherlink II 16 Bit Coax/TP	$159/169
3 Com 507 Ethlink II 16 Bit Coax/TP	$289/299
3 Com 509 Ethlink III Coax/5Pk	$119/505
3 Com 509 Ethlink III Combo/5/20	$145/559/2199
3 Com 529 MCA III 10BT/5 Pk	$229/959
3 Com 579 EISA Coax/10 BT	$235
EagleNE2000 Plus /5Pk	$109/514
EagleEP2000T Plus/5pk	$89/385
Asante Etherpack2000+ Coax/10 BT	$129
Microdyne NE2000/2000+	$109/94
HP Ethertwist PCLink/6pk	$159/759

ARCNET

16bIT Star/bus Topology-combo	$65
4Port Passive Hub	$15
8 Port Coax stackable Active Hub	$139

ADAPTERS for TOKEN RING

Intel Token Express 16/4 ISA/MCA	$429/469
SMC Token Ring Adapter 16/4	$345
3 Com Tokenlink III 16/4 ISA/EISA	$455/635
IBM Token Ring Adap II	$289

POCKET LAN ADAPTERS for Notebooks

Advanced LAN Net Coax/10BT	$129
XIRCOM PE3 10B2/BT/BC	$274/274/299
XIRCOM 16/4 MBNS Tokenring w/Type 1Bnc	$525
Xircom 16/4 Tokenring w/Type 3Coax	$525
DLINK DE-600 Softconfig. Coax/10BT	$172

PCMCIA ADADAPTERS for PalmTops

DLink DE-650 Coax/TP	$191/195
NATIONAL NE4100 COAX/10 BASE T	$214
XIRCOM Credit Card BNC/RJ-45	$269
XIRCOM Crdit Card Courso	$299
GVC Adapter	$137

CABLES & CONNECTORS

ETHERNET RG58 or RJ45 10BaseT

Readymade w/Connectors 10'/25'/50'	$4/8/12
Bulk 1000' SPOOL	$89
BNC 50 Ohm Terminators/Crimp-ON/Barrel	$1.49
BNC T-Connectors	$1.99

CONCENTRATORS

CeLan 2-Port BNC/AVI Repeater	$235
Ce-Lan 4-Port BNC/AVI Repeater	$445
Allied Telesis 4-Port Repeater 2AVI,2BNC	$750
Allied Telesis,4-Port,8BNC,1AVI	$699
Allied Telesis,8 -Port,8 BNC,1AVI	$785
Allied Telesis-3008 Multi-port 8BNC,1AVI	$1189

We provide Complete Networking Installation and Maintenance-Services

HUBS

GVC 8 Port Hub	$179
CeLan 8 Port 10 BT w/BNC Cascade port	$174
CeLan16 Port 10BT w/AVI exp. port	$389
CeLan 16 Port 10BT-managable hub	$439
Allied Telesis 12 Port RJ45,1AVI	$459
Asante 8 Port Hub,8RJ45,1BNC	$249
Asante 12 Ports,12tp,1BNC Thin,1 AVI Thick	$464
Asante 12 Ports-12TP,1BNC,1AVI	$834
Asante 1701 Smart 12Ports/SNMP	$1019
Microdyne 18 port 10 Base T5000 series	$619
D-Link 12 Port 10 BaseT	$399
D-link DE-1500 w/SNMP	$869
D-link K1032 32Port w/SNMP	$1199
Intel EE 12 Port 10 BT Hub Int w/Harmonica	$634
Intel EE 12 Port Hub Int EISA w/Harmonica	$699
SMC 8 Port Concentrator/12 Ports TP	$325/599
Synoptics 2800 A 16 Port w/AVI	$699
Synoptics 2803 16 Port w/AVI	$749
Synoptics 2804 16 Port w/Fiber Optics	$951
3 Com Link Builder 3C621 12 Port	$729
3 Com Link Builder TR 3C510180/82	$1751/3599

BRIDGES

Allied Telesis local Ethernet Bridge	$1645
3 Com 802C NetBuilder local Ethernet	$3399
3Com 750 NetBuilder Token Ring local	$4714
3Com 5823C NetBuilder Remote	$5319
Synoptics 3323S Ether Local w/AVI	$2353
Synoptics 3522 Token Ring	$5319
Novell Multiprotocol Router v 2.0	$669

PRINTER SHARING

ETHERNET/TOKENRING/APPLETALK

Internal: Card seats into existing slot in printer

Jetpress XOI HPIID.IIID 10BT/2	$363
Jetpress XIO same token ring 16MB	$663
Jetpress brother HLIO Combo	$373
Jetpress MIO HP IV/M/SI/IIISI/1200L	$353
Jetpress MIO Plus w/Extra 1P,1S	$589
Hewlett-Packard:Jetdirect cards available	$call

External: Compact In-Line device

Intel Netport II for 10BT/2(1P,1S/2P)	$383
Intel Netport II Tokenring w/DB9(1P,1S/2P)	$573
Intel Netport Xps XL Ether/Token(2P+1S)	$473/633
Castelle Lanpress 1P/1P+1S 10BT	$363/393
Castelle Lanpress 1P+1S/2P+2S Combo	$473/453
Castelle Lanpress 1P+1S/2P+2S Token	$663/793
Lanpress Ethernet BNC,3S	$523

Portable: Fits into one printer port

Eagle NPE400 Pocket 10BT/Coax	$339
Xircom Pocket 10BT/Coax	$283/289
Xircom Tokenring STP connector	$543

DEDICATED PRINTING BASED

Simple AUTO-SWITCHING

2 Computers to 1 printer Electronics	$24
4 Computers to 1 printer Electronics	$38
2 Computers to 1 Printer Bi-directional S/P	$49/45
4 Computers to 1 Printer Bi-directional. S/P	$69/61
*Fax Swithcher 2 Port Fax/telephone	$85

ADVANCED Printer SHARING

PrinterNET Transm/Rec. Kit w/25' cable	$69
PrinterNET Starter Kit	$155
(It can connect up to 16 computers w/6 printers)	
ModularLink Transm Kit DB-25(w/25')	$40
ModularLink Receiver Cen	$45
ModularLink Starter Kit	$106
(It can connect up to 16 computers w/1 printer)	
Prima NET starter kit	$249
Transmitter/Receiver kit with 25' cable	$99
(It can connect 32 nodes in peer-to-peer networks)	

NOVELL NETWARE

Ver 3.12 5/10/25/50 User	$604/1375/2154/2911
Ver 3.12 100/250 User	$4076/7279
Ver4.01 5/10 User	$815/1863
Ver4.01 25/50 User	$2737/3669
Ver4.01 100/250 User	$5125/9143
Ver4.01 500/1000 User	$15375/27932
Netware for MAC V3.12 200/1000 User	$679/909
Netware Lite v1.1 w/Win utilities	$72
Netware Lite v1.1 w/Win Util&Dr. DOS	$90
Dr. DOS 6.0/7.0	$72

(Novell prices change frequently, so please call for the latest price changes)

ElECTRONIC MAIL

by CC:MAIL

Platform Packs: *(For connectivity on all LANs and across all LAN Bridges and Gateways. For support of any combination of Server-to-Server, LAN-to-LAN, and Remote Workstation-to-LAN messaging. One Platform pack is required for configuring any system)*

CC:Mail DOS 4.2/Win 2.0/Unix 1.0	$199/325/345
CC:Mail Macintosh 2.0/OS2 3.2	$329/345

User Packs: *(For adding users to the Platform Pack)*

CC:Mail 10/25/100 user v4.0	$229/549/2097

Remote Users: *(For connecting one remote user to any CC:Mail user net via Public Telephone Lines)*

CC:Mail Remote for DOS3.3 or Mac 2.01	$199

Gateways: *(For exchange of messages with other CC:Mail Post Offices on the same LAN or Bridged LANs)*

CC:Mail Router v4.0/Fax 1.2	$839/1298

EASY/DO-IT-YOURSELF NETWORKS

ASA

(2) copies of Novell lite, (2) NE 2000C Cards, Cables, Terminators etc	$249

WINDOWS FOR WORKGROUP

Add-On 1 user/2user kit w/Win3.1	$149/
Add-On 1 user w/o Win 3.1	$48
Multi-Unit 20 Node/Server	$734
Windows NT Advanced Server	$949
Windows NT v3.1 regular	$329

ARTISOFT PRODUCTS

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6GB,4ea,2GB ST Barracudas	$12995
8GB,5ea. 2GB ST Barracudas	$15495
1GB,Hot Spare	$1050
2GB,Barracuda Hot Spare	$2395
Add second channel module to split the drive packs	$895

SOFTWARE RAID: Subsystems includes NLM for Novell,Cd Rom, and Juke Box

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8GB,5ea.2GB drives,10msec	$11995
1GB Hot Spare	$1050
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(For information on RAID products please call Paul Gulati at (408)496-6853 x 208 or 496-6953 for any sales person if Paul is unavailable)

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APC-BK400, 10 min, 286, 386SX, ws	$164
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APC 2000, 20 min, Mini Computers	$1134
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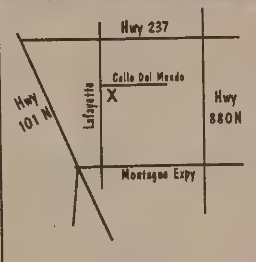

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4x9-80	152
4x9-60	159

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DRAMS

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NEC Silentwriter 95 2 MB	109
TI Microlaser 1 MB	69
Packard Bell Video Memory 1 MB	39

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	4 MB	310-2467	189
	8 MB	310-2468	349
	16 MB	310-2469	669
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	8 MB	129769-003	395
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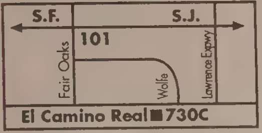

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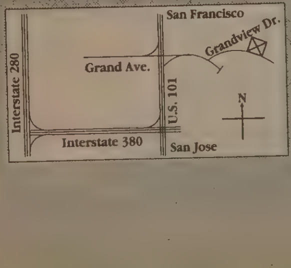

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WAIS

—a new vision for publishing

By Michael Robin
Photos By Anne Knudsen

Anyone can publish their "words to people in forty-five countries with only a computer and a telephone. That's all it takes," explains Brewster Kahle, founder of WAIS, Inc.

Kahle is describing what he calls network publishing—the publishing, or dissemination of ideas, using the technology of wide area networks, such as the Internet. He sees it as a quantum leap forward in the history of communication. Network publishing promises to give virtually everyone the ability to be both a publisher and a consumer of ideas and information. Everyone will have access to the tools for publishing as well as the tools to access published information.

Network publishing can be viewed as the beginnings of the next step in how we communicate. "Desktop publishing," says Kahle, "transformed the publishing world by allowing the writer to make 'camera ready' material. The computer networks now allow that writer to spread their words far and wide without ever going to paper... Using these networks is much cheaper than using the older mainframe systems like Dialog or Mead Data. All in all, the new inexpensive medium is creating a new type of expression on the net."

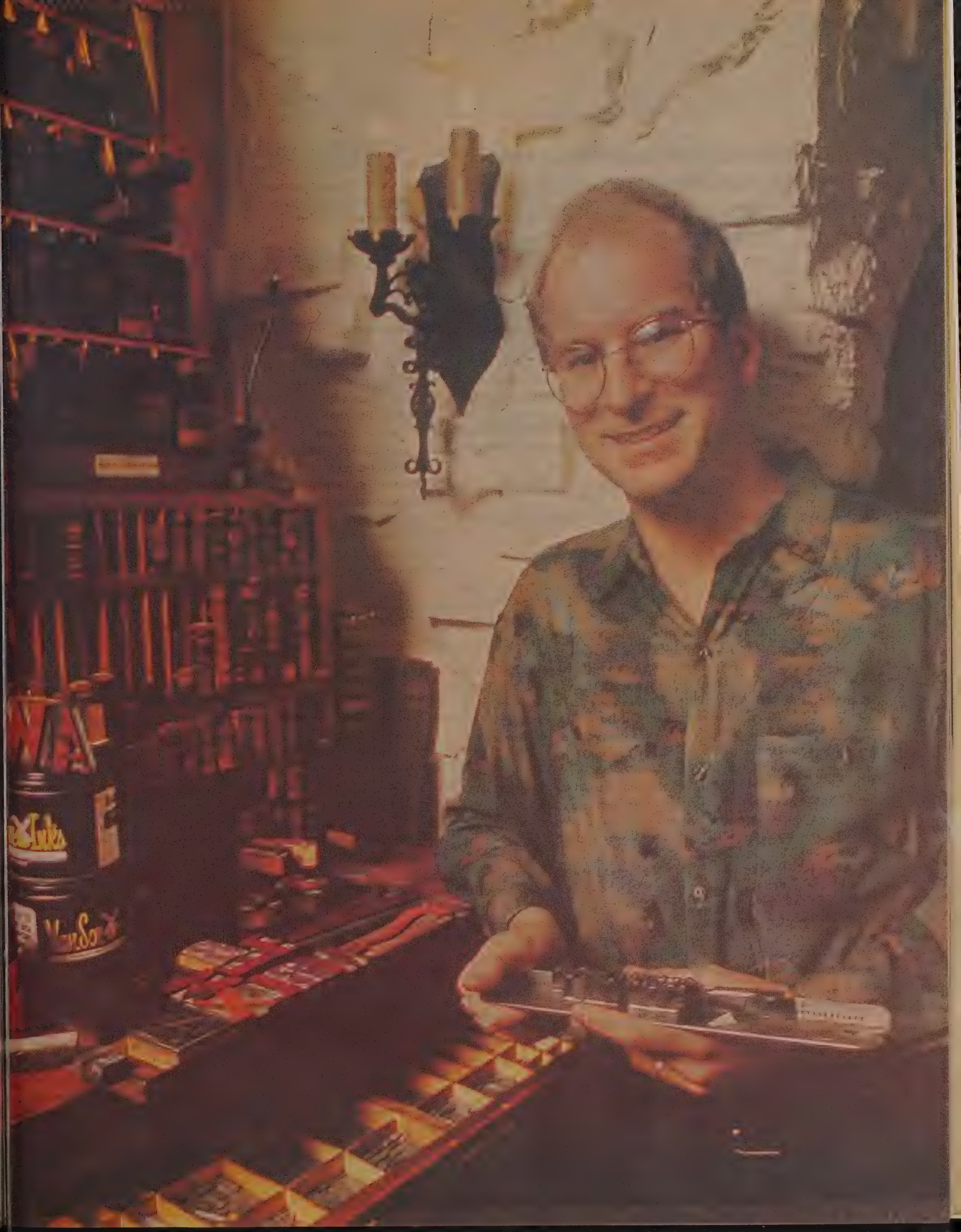
The development of communication tools and their impact on societies can be traced from oral communication to hand-written manuscripts to the printing press. At each step knowledge became "more portable, more accurate, more convenient to refer to, and, of course, more public," as Daniel J. Boorstin, librarian for the Library of Congress, points out in *The Discoverers*. The consequences of making knowledge "more public" is fundamental to a democratic society. Thomas Carlyle, English essayist and historian, observed in 1863 that: "He who first shortened the labor of copyists by the device of movable types was disbanding hired armies and cashiering most kings and senates, and creating a whole new democratic world."

The information contained in the early manuscript books was unorganized by today's standards—there were no indexes, punctuation, or even page numbers. The advent of the printing press precipitated an explosion in the amount of knowledge available throughout society, but for many decades there was no useful system for archiving or cataloging these books. All of this combined to make retrieving information difficult.

Similarly, the information available on the Internet today is usually plain, unformatted text, scattered across servers around the world. Searching, retrieving, and sometimes even reading these digital documents often requires familiarity with UNIX commands and other technical jargon. The volumes of information available on desktop computers across the Internet has given renewed meaning to the term "information overload." And until recently, the only way to locate a specific document was to already know exactly where it was—which server, directory, subdirectory, and the file name.

Brewster Kahle is one of the people developing ways to improve access to and retrieval of published documents. First at Thinking Machines and then as founder of San Mateo-based WAIS, Inc., he helped create WAIS, Wide Area Information Servers, a remote search and retrieval resource for networks such as the Internet. WAIS is one of several relatively new resources on the Internet that seeks to help users navigate online to provide and/or find information. Kahle hopes that WAIS will help lay the foundation for transforming the way we communicate.

I met with Kahle to discuss what WAIS software is, how it works, WAIS, Inc., and his vision of network publishing.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As more and more people are getting on networks and large corporations are building private enterprise networks, better tools for navigating and searching the nets are becoming available, tools such as gopher, WAIS, archie, Web, etc. Putting WAIS in context, how does it fit into this puzzle?

WAIS is one of the tools that are being used now on the Internet. There are three really wildly popular ones—gopher, World Wide Web, and WAIS. If you think about this as what we're constructing is a large network book, gopher is the table of contents, a hierarchical browsing approach. World Wide Web is hypertext pages. It's the realization of Ted Nelson's dream, in terms of technology, of clicking from one page to another, jumping to author to author to author. WAIS is the back of the book, the index: It's the place you turn when you know what you want. WAIS is trying to help people search through gigabytes of information that's located in hundreds of locations around the world.

To use gopher you don't need to know particular sites or where the information is on the nets, but for WAIS you need to know specific locations.

It's a two-step process with WAIS. One, you have to find the data source that you want to look through. There are directories that help you find the right data collections, whether it's a poetry server or weather server, whether it's a genetics database in Singapore or the IBM PC frequently asked questions server in Mexico City; you have to find which of those you want to use.

You ask the directory of servers a question. Say you're interested in how to hook up your IBM PC to an Ethernet network You'd ask the question, "I'm trying to hook up my IBM PC to an Ethernet network," to the directory of servers. Hopefully there will be some descriptions of databases that have some of those words and phrases in them and they'll be suggested back to you. There may be four or five databases that will have information on IBM PCs.

You would then select one or several of them and pose your question to those databases, which can be located anywhere around the world. You don't care where the servers are. You use a server the same way you'd use it as if the data were on your own local machine, and it all works at pretty much the same speed. You can search through gigabytes in just a few seconds no matter where it is in the world.

The idea is that you actually ask your question in the English language, like the example, "I'm trying to hook up my IBM PC to an Ethernet network." The servers don't understand what you're saying. They're just trying to find documents that have those words and phrases in them. If the words and phrases exist exactly, as in your question, the document receives more weight. If it's in the headline, it receives even more weight. The list of documents are ranked and the top ones come back at the top of the list. The server says you might want to look at these. You can browse them, then by clicking on them, retrieve the information you want.

You can also say, "I like that one. Find me more like that one." WAIS uses the server again by getting this positive feedback from the user. It knows a lot more what it is you are interested in. It can use a document as a big search term to find other similar documents.

What is the Directory of Servers?

The WAIS software indexes all the words and phrases in each document so that you can find appropriate documents. A "Directory of Servers" is a database of descriptions of servers and a major one is operated by Thinking Machines. This can help find appropriate servers to use.

We hope that the combination will help people find the most appropriate documents to read.

From the end-user perspective, what is happening when I do a WAIS search?

WAIS is the system that sits next to the publisher making their information available. The users can use different interfaces to get to the information—gopher users work with certain interfaces, World Wide Web users will use something else. The America Online interface to WAIS is going to be available very soon. So there are lots of different interfaces to the same information.

If you're cruising the net using Web and hit a search box, often you're using a WAIS resource behind it. If you're using gopher and you hit a question mark icon, and up pops a little box, "What do you want to search?" you're probably using WAIS underneath.

The idea is that publishers have something to say to lots of different audiences and those audiences are going to use whatever devices they want for finding that information. Everybody's got a religious bent, whether they want their PC, their Macintosh, their Newton, their General Magic machine—whatever interface they want to use, we just want to be able to have the information get to those users.

Have there been conflict or problems by the ways people in different professions or cultures ask questions?

Some people are very careful about how they ask things and some people just blather. There are some people that say "IBM PC" or "Ethernet transceiver" and that's all that the server gets to try to figure out from the tens of thousands of documents that it may have which ones you want. Some people will use English language, as if they're talking to another person. We're trying to make a system that will work in those environments.

Another class of users are the real expert searchers, the ones that know how to use Boolean language and fielded search, they know this word, or I want this word next to this word and the author equals this; these are the librarians and professional searchers. Lawyers also know these types of things. We're trying to make a system that is useful by everyday people to just browse and have fun, and for other people that really know what they want to be able to screw down and get just those three documents.

Is WAIS available for different languages?

Yes, the European languages, and Fujitsu is making a Japanese version.

I saw an interesting thing that Fujitsu had done. I don't know if they're going to release it, but they integrated online machine translation so you can ask a question in English against a Japanese database and it translates the Japanese documents into English for you to see. It was mind-blowing. Of course it's not perfect translation. Even people aren't very good at translating English to Japanese or vice versa, but it did make it readable. The aspect of making it so that people in Japan can communicate more freely with people in English through these publishing mediums with electronic assistance is astounding.

There is an important step before full-text online translations, and that

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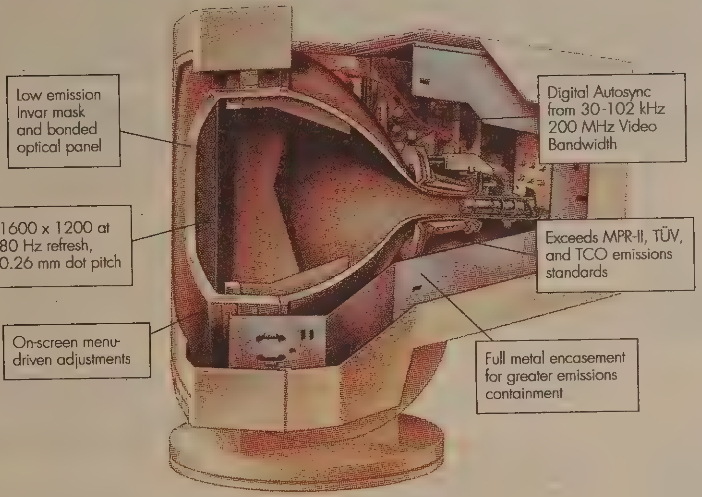
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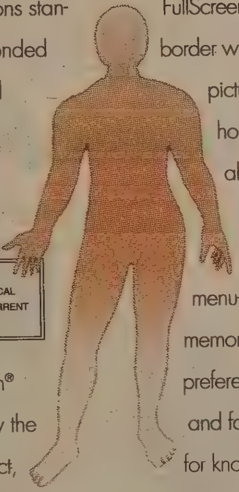

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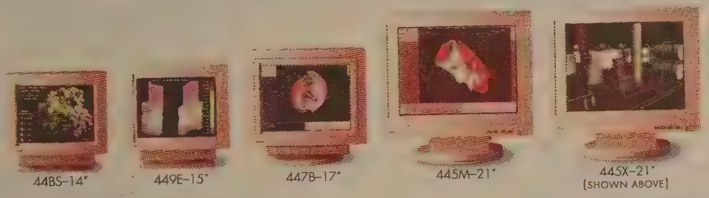
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is just being able to search across servers in the different languages. For instance, posing an English question to a Spanish-language database.

You can do that now and the standards are catching up to make that done in a completely standard way. We still have problems of how do you represent all of these languages in computer-readable form? Kanji is a problem, not just that it doesn't fit into 8-bit ASCII. It takes 16 bits or more. But trying to find where words start and stop in Kanji is a challenge. There are many aspects to WAIS that aren't just of displaying document problems. WAIS really has to understand a little bit about the document to know where the words and phrases are and what's important about them so you don't get irrelevant material. That changes from culture to culture and language to language.

In addition to text, how does WAIS deal with multimedia documents?

You can search databases of text as well as images and video clips or whatever. WAIS uses tags—natural language tags which are descriptions of documents, descriptions of pictures, or maybe it's the sound track for the video. Define what video you want and then, when you double-click on it, it can be anything, a word processor document, pictures of Europe, rock music recordings.

And retrieving them?

It can be done over the networks transparently. There's a speed issue. Text is able to be done easily over modems. For still images, modems are getting to be a little slow, but the Internet connections, which tend to be 56K, are fine for this. We need faster speeds for doing video and audio.

There's no reason to think that this technology is not going to help make video archives or video artists able to publish their media where they are unable to now through the Blockbuster-type chains. It's changing the publishing equation by allowing individuals to publish on the networks as opposed to having to go through large-scale publishing enterprises.

WAIS, Inc. provides the back-end, or software for the publisher, while the front-end software is freeware?

Most of the WAIS software is not done by WAIS, Inc. It's been done by the freeware community, which is this phenomenally rich, interesting group of people that are spanning the globe working together to make an open information infrastructure.

Most of the user interfaces that are available now are available for free on the Internet. You can use file transfer from wais.com to get them. There's even free server software, but for those people that want to go into production, that want to have really good searching, they tend to want a commercial-grade tool. That's what we sell. That's how we support ourselves. But we're very much dependent on the freeware world to keep the freeware good and also, the most important thing is to get rich information resources out there in lots of specialties.

And how closely do you work with the freeware people?

Weekly basis, daily basis. We're a major distribution site for the freeware. We put out some of our enhancements as freeware. Basically, we need critical mass in terms of a publishing system so we're all talking the same protocol. The key piece is Z39.50, URLs, and a bunch of other acronyms out there. The idea is that it's open protocol, not a protocol that is "open" that's really owned by a company.

Do you foresee some of the front-end software being commercialized?

Absolutely. Apple has just announced that they are "gatewaying" from their AppleSearch product to the Internet WAIS servers. So you can, from your Macintosh environment, search the Internet using this product that's due out later this year.

What do you mean by "gatewaying" from AppleSearch to WAIS? Does that mean it is another type of WAIS front-end?

Apple doesn't like to think of it that way. I would put it the other way around—people in the AppleSearch environment can get to WAIS resources. So people in the America Online community can get to WAIS resources, like people in the gopher community can get to WAIS resources.

What is the relationship of AppleSearch to the WAIS engine?

AppleSearch will be able to search WAIS resources on the Internet. Apple is one of the original members of the WAIS project, which included Apple, Dow Jones, Peat Marwick, and Thinking Machines. An existing project at Apple was working on a similar problem for the local area networks that became AppleSearch. WAIS offered a method to opening it to the outside world.

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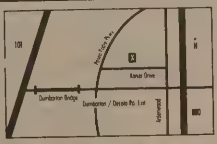

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WAIS In The Market

Who are the primary markets for WAIS?

We have two major ones and two minor ones. One is the government. The Environmental Protection Agency is making a set of services available on the net through WAIS. The Library of Congress is making some of its picture collections and things they had on CD-ROM available on the net. So the government has a traditional role of distributing information to very wide populations.

Another is publishers, traditional publishers that want to use this in a new way. We have two others, which are large corporations that want to publish internally and to the outside world. As we have more globally distributed companies, keeping people in touch about what is going on within the company is a real challenge.

Libraries are also trying to figure out their role in the new worlds of networks and electronic text.

Are there commercial WAIS servers?

They're just starting. There's a commercial WAIS server that's offering some government information. You'll see the roll-out of the *Wall Street Journal* in April. *Encyclopedia Britannica* is in test now and it will go live in the fall. So it's all just happening now. It's very exciting to see the shifts happening, there are a number of commercial enterprises setting up shop where they're selling information over the net.

Are there mechanisms for payment?

Network publishing can support any type. You can charge per document, per search, however you desire. The mechanism people are looking at most is subscription-based, you can use the *Wall Street Journal* and all the back issues, all you want for a month for similar pricing to what you'd pay for a paper copy.

That's the thought that's going into pricing in these environments. It's low-price so end-users, everyday people, can use these information sources and they can use them all they want.

Besides the projects by Dow Jones and Encyclopedia Britannica, are large corporations using WAIS on their enterprise networks?

Perot Systems and Lockheed are examples. Perot Systems put all the resumes of everybody in the company on its computer so you can find people. They have contract proposals, presentations, and have also downloaded some CD-ROMs, by paying the CD-ROM publisher and making it available to their company.

Is there competition to WAIS? Others like Mead Data, Lexis/Nexis? Is one of the major differences between those services and WAIS the issue of open protocols?

The difference between us and the Dialogs and Mead Datas, which are centralized publishing models, is that WAIS is decentralized. It's uncontrolled and uncontrollable. Anybody can go and use the software and make their words known. So it's more based for open networks and distributed computers. Lotus Notes has been targeted mostly for LAN-based environments within a company where WAIS was designed for cruising databases all over the world. You don't know exactly what you're looking for, so it's oriented a little bit differently, although all of these systems, we hope, will become compatible with using WAIS resources. So we would love Dialog's and Mead Data's data to be available on the Internet through the open protocols of WAIS, as well as Lotus Notes. We want those users to be able to get at WAIS resources. Are either of these happening? There've been talks about it but nothing concrete.

I don't think that there's really direct competition because the networks are too new. Gopher, World Wide Web, WAIS, we all gateway to each other. They're all based on open protocols. I'd say the way we'd lose is if we didn't do a system that's good enough so that there's room for a proprietary solution to come in. That's the danger. All the other companies, the search engine companies, the database companies, got very excited because they can get at more users, they can get at more information, that's a win-win situation.

We talked about the end-user. What is the provider or publisher doing with WAIS?

There's the traditional publishers who are using this as a mechanism to distribute their work in a new way. For examples of some of those involved, Dow Jones will be distributing the *Wall Street Journal* and same day *New York Times* on the Internet through the WAIS system. Another is Encyclopedia Britannica, who is bringing their whole encyclopedia to the Internet through WAIS and World Wide Web. This is where you get traditional publishers seeing WAIS as a mechanism to get to people all over the world by having their information in one place and selling subscription services.

We're also seeing lots of other people becoming publishers. And that's the new thing I see that is societally interesting, as new things happen because we have this new technology. So, for instance, Sun Microsystems is distributing all of its information, press releases, bug fixes, etc. over the nets using WAIS. Small groups, like the A Right To Keep And Bear Arms group, have also set up their servers. It's not my particular cause but I'm really glad that they're able to have a mechanism to make their point of view known. So we're getting lots of people publishing lots of different types of documents. We want musicians to be able to not only publish for free but also be compensated for their work where before they were not able to find the niche within the traditional publishing environment.

WAIS and WAIS, Inc. grew out of something you were working on at Thinking Machines. Unlike most other Internet tools, there seems to have been a commercial vision for this project from the get-go. What were you doing at the time that led to this project?

Thinking Machines is a parallel computing company. In the early '80s it suddenly had hundreds of times more computing power than people ever had before. The question was, What do you do with it? Well, you can simulate weather better. You could try to find oil under the ground. But we also thought that there was something we could do that would be usable by everyday people. Finding the right things to read was the one that we had in our minds from a project that we began back at MIT.

When the [Thinking Machines] computer came along, we tried out search-

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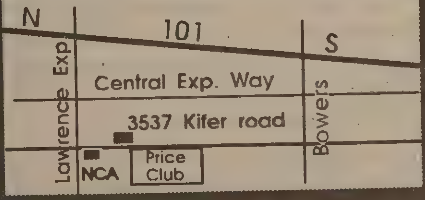

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ing through gigabytes. In 1985, we did a project searching through 15GB with a twenty thousand-term query and it only took three minutes. It took a supercomputer to do it, and this was one hundred times faster than anything else at the time. You could browse through colossal collections. Of course 15GB is not that much anymore; that's about what you work with on a workstation or high-end PC.

What Thinking Machines had was a view of the future, of what things would look like in ten or fifteen years. Now we're at that time and it doesn't require a supercomputer. In the mid-'80s, when Dow Jones bought one of these systems to search through 450 magazines and newspapers to find the articles you wanted required a supercomputer. Now it can be done on a Sun microcomputer or almost any kind of UNIX box.

Another way to look at where the project came from is, "yes, it came from a very commercial background." We think it's important that people be able to be compensated for their work, or you can't have an enduring environment. When the printing press came along there wasn't the concept of copyright, and it took 150 years to get the royalty systems together that we now have for books and newspaper publishing. At that time writers more or less donated their work, or got a fixed fee, a one-time fee for their work. If we can help the network environment establish a process so people can be compensated for their work, the whole field will expand much more quickly. We want high-quality information as well as free information out there. The technology is not innately worth anything. It's the content that you can get to people that's important.

What brought Thinking Machines, Dow Jones, Apple, and Peat Marwick together to develop WAIS?

Thinking Machines and Dow Jones built an innovative search system called DowQuest, and we thought it would radically change the world. Well, the world wasn't terribly different. Yes, they made money on it. It was an interesting product. But it didn't affect everyday people. The question was, Why? Was the pricing wrong? Were the networks not there? Did it need a graphic user interface? What were the pieces?

So I spearheaded a project to say "all right, let's figure it out. Let's go and get a group of companies to work together in relative secrecy to figure out what it takes" Apple Computer is world-renowned for great user interface design; Thinking Machines for search engines; Dow Jones for one-stop shopping for information for business people; and Peat Marwick represented a community that knew what their time was worth—they were a perfect community, non-techies. If we could make it usable by the partners at Peat Marwick, we'd have a system that would work. And we built a system in nine months, a crack team of people across the country. We found that, yes, Peat Marwick's people did like it, they would use day by day.

The problems were the networks. The network was just too hard to construct. This was back in 1989. The Internet was still a research network. It really wasn't mainstream at all. And that's when we looked around and said, "Well, the Internet is working. Let's use the Internet as our model."

Thinking Machines produced a freeware release. It was a little hard to argue for this with the management at Thinking Machines. We were saying, "We want to take this new idea and distribute it in the public domain, no copyrights, no patents, no control. Anybody can take it, copy it, merge it into their own programs."

"Why would you possibly want to do that?" was a question I had to answer. And the answer was that we wanted to catalyze a market for information servers. We needed a critical mass and the only way to do it was to seed the market with a good enough system to get the ball rolling. Thinking Machines is a long-range company and they said, "Great, let's do it." They wanted, after the market was built up, to sell supercomputers to this market. They've sold a couple into it already, but as the market grows, there will be colossal text collections that will need their computers. So it was not money badly spent from Thinking Machines' point of view. But it did set a precedent that these systems are going to be open.

Does WAIS offer a new business model for the networks? What is the relationship of WAIS, Inc. to the Internet culture where, traditionally, information was distributed freely? Also, what would stop anyone else from taking a freeware version, enhancing it, and providing the support services you offer?

That's several questions. Is this a new business model for how to disseminate information? Absolutely.

I think there will be an enduring need for free components—they will always be available, but may not have all the features. There are people using this system in schools that would just not be able to buy much software. So, it's important to have a free version out there.

It's also important that when people need more features or capability that there's an avenue for them to get what they need, which is often not the case on the Internet. You can't buy quality versions of some of the things on the Internet even if you wanted to, yet. We think that there is room, based on open systems, to have commercial and free versions at the same time.

You asked the question, "Can someone come in and compete with us?" Absolutely. We're playing the open systems game. When we started the project with Apple, Dow Jones, Thinking Machines, we said it was going to be based on open protocols. In fact, at that time the protocols weren't very good; we needed to get them better. We've spent about half of our engineering resources

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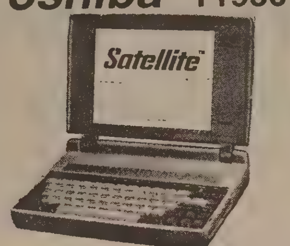

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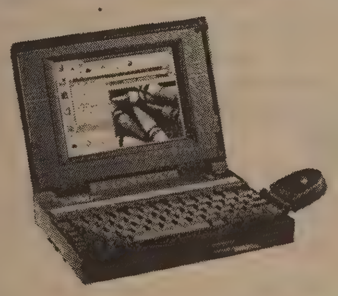

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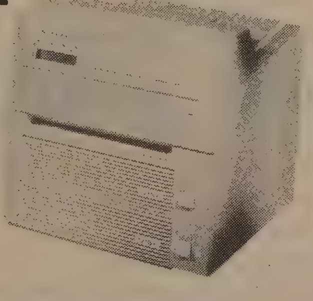

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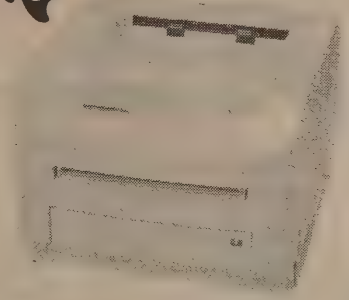

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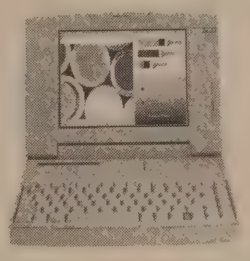

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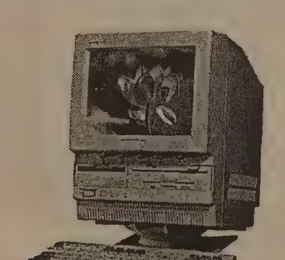

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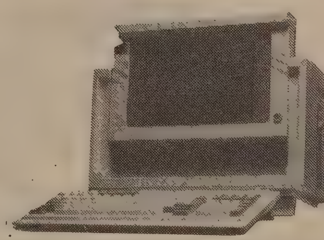

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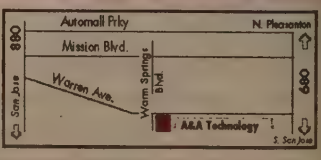


making the open protocols good enough for our competitors to use. Why? Because it needs to be an open system to expand, to be an interesting environment.

As a business model, providing commercial support for freeware, how similar is WAIS, Inc. to Cygnus, which supports GNU software?

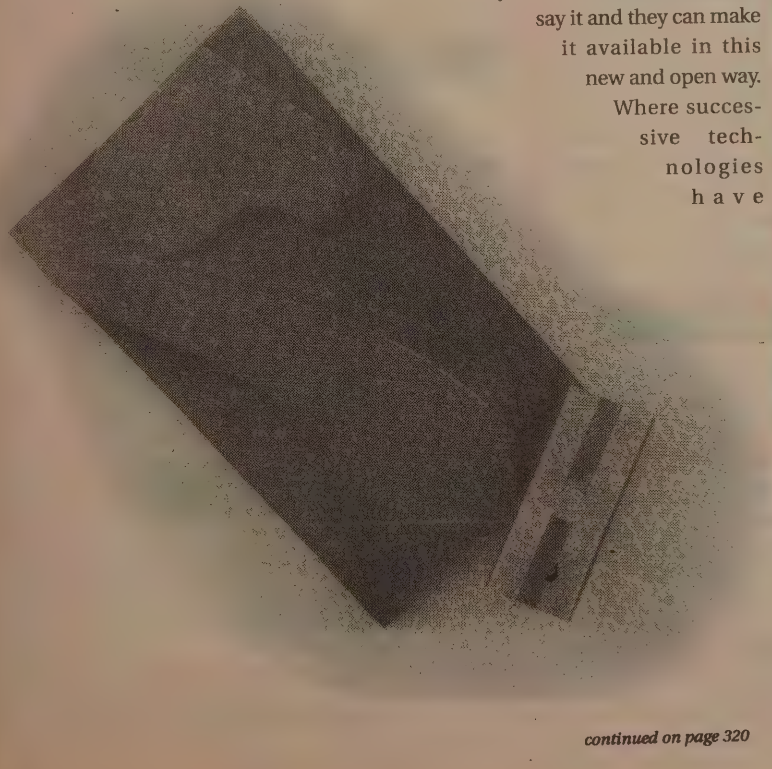
We're quite different from the business model of Cygnus. Our server has been rewritten from scratch. I helped write some of the freeware version of the server software. But when we formed the company, we started over and rewrote the system from scratch based on the protocol Z39.50. It's a completely different implementation that's much higher quality, and it's portable and has been extended in many different environments. Unlike Cygnus, which is all the same code base and they provide support, this is a different product. There are other companies implementing WAIS standards and those are completely different implementations. The important thing is that we all have the same protocol. So where most people talk the same code base in the PC world, in the network environment it's not the code that's important, it's the protocols.

So that everything, whether it's a WAIS server from you or something developed from freeware, they all communicate.

They all communicate.

You have written about network publishing, describing it not as something replacing books or even saving trees, but as a new media form. What is your vision of network publishing?

For me the important aspect of network publishing is not that you can now peruse the library in Moscow from your desktop machine. It's turning the equation around. It's that anybody with something to say can now have a forum to say it and they can make it available in this new and open way. Where successive technologies have



continued on page 320

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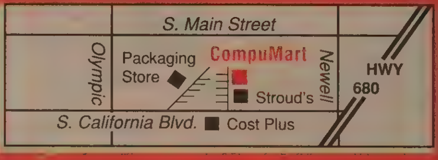

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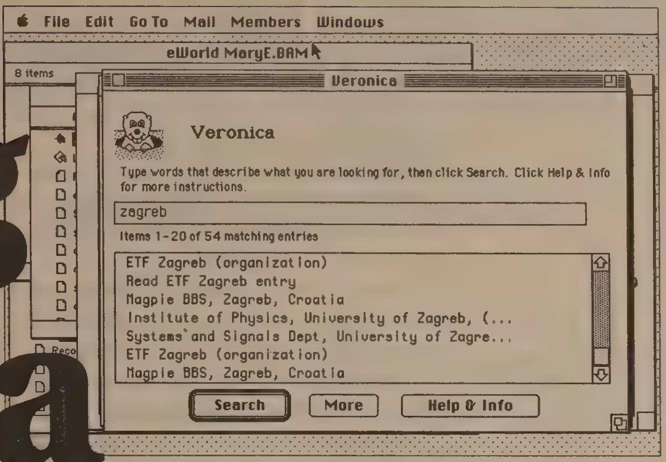

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Or, Why A War-Torn Country With No Money Built A National Computer Network

BY PREDRAG PALE

Predrag Pale is a teacher at Zagreb University, the director of the Croatian Academic and Research Network (CARNET), and the deputy minister of science and technology for the Republic of Croatia. This article is excerpted from remarks made by Mr. Pale at OSS '93, the Open Sources Solutions conference held in Washington, DC, last November. To learn more about the conference and information disseminated by Open Source Solutions, Inc., send Internet mail to oss@oss.net, or call (703)242-1700 /fax (703)242-1711.

I'm going to speak about Croatia, and how a country with nothing may use the information technology to make war and find peace. Why should we speak about Croatia and such an event? Why is Croatia so special?

Perhaps because Croatia is the geographical place where several events that are happening in the world have come into one point. Croatia is a new state, established in 1990, recognized by the United Nations in 1991. Croatia is one of those states coming from a socialist or communist economy and ideology, and is facing the need to restructure. And the third fact in Croatia today is that Croatia has war.

All burdens, all problems, each of them big enough, and all of them together a small nightmare.

BIRTH OF A NETWORK

In the year 1991, in autumn, five hundred tanks were hurtling down the freeway from Belgrade to Zagreb in an attempt by the ex-communist regime, now being guided by Serbia, to seize, to capture, to destroy the idea of independent Croatian state, and to reestablish their power. In those very days—it's literally so, it's not a metaphor—when tanks were hurtling down, we didn't know whether we would survive, what would be with the state, what would happen to us as individuals. In those days, the ministry of science and technology decided that it's high time to establish a scientific computer network. And we managed to convince the government to spend one million dollars to establish such a national backbone and infrastructure.

It was very much money. The war in ex-Yugoslavia is that Serbia has gained control over the ex-Yugoslav army and started to attack Slovenia, Croatia, and today, Bosnia-Herzegovina. They had the army, they had police, they had weapons, they had money, they had media, and they had foreign affairs. The other parts of the country who were attacked had nothing.

So in those times, literally every gun was counted. In those days it wasn't very easy to convince people to spend one million dollars for a computer network.

Why did we want to do this? Why should we do this when, literally, tanks were coming in, we were waiting for occupation—I was in charge of destroying all computerized records regarding people to make it very difficult to seize them quickly and take them to concentration camps.

Well, the first idea is, well, to lead the war. We know that one of the first things established in preparation for Desert Storm was a computer network. Indeed, to lead a high-tech war today, a sophisticated war, you need a computer network. However, the war in ex-Yugoslavia is anything but high-tech and sophisticated. In many aspects, the second World War is a high-tech war in comparison to what we have. In many aspects, the war that we have is pure terrorism. If somebody is firing two shells a day on a city, on civilian targets, it's terrorism, it's not a war. Sources that Croatia had at its disposal were not suitable to be controlled via computer network.

The second idea why we should build a computer network—well, it's a good way to make public relations and propaganda. Yes, but we lack people would know how to do this. One day we might be able to do this, but at that time, we did not know.

The prime reason why we decided to do this was because we understood at that very moment that if we will survive, and if we want to survive, we have to have a strong economy, we have to develop in a modern way. And we understood that the basis of the new economy was knowledge. We also understood that we could survive only as an active part of the world. Interactive, as a matter of fact. In order to enable this, we had to have a means of communication, acquiring knowledge and disseminating our own knowledge.

I said that Croatia is a new state. Croatia had its statehood a thousand years ago, but what counts when it comes to practical matters is the last fifty years. The last fifty years we lived in Yugoslavia, and governmental, public administration, foreign affairs, military, police jobs were mostly occupied by Serbs. Croats were represented, but in very small numbers.

So when we decided to declare the state and we established our state, we actually lacked, and still are lacking, many professionals able to lead the country in some segments. So if you want to continue and to survive, you have to use those individuals efficiently, and all the resources you have.

Information technology, thank God, is here and is usable and is comparatively cheap. So we understood that this is the only way we can use our resources and survive.

Croatia is in many aspects very similar to Norway. The amount of land we have, the population is about four and a half million. Similar to Norway, we have four universities; about two hundred research organizations, these are higher education institutions and purely research institutions; about ten thousand active researchers; and sixty thousand students.

Of course, the situation in the computer network prior to establishing the independent Croatian state was poor. In ex-Yugoslavia we had a public switched digital network based on X25 protocol, but we had no scientific network. And even this public network was poorly used—simply, the market had not been created. Nobody understood what it was good for.

If we wanted to continue, we needed something cheap, something that could adopt new technologies and go into every place. Croatia has the very unfortunate shape of a boomerang. Many similar efforts to establish a national academic and research network strive to establish a national backbone. Yes, we wanted to do this, and we did it connecting our four cities with dedicated lines. Unfortunately, because of the shape, it has to be star-shaped today.

FROM THE VERY BEGINNING, WE WANTED TO ENABLE OUR PEOPLE TO COMMUNICATE WITH THE WORLD, TO GET THE KNOWLEDGE AND TO TALK TO THE WORLD. BUT WE ALSO WANTED, FROM THE VERY BEGINNING, TO PUT THEM IN A POSITION OF INFORMATION PROVIDERS.

But many of our institutions had only PCs and not multiuser, multitasking computers. So we had to go one step further. From the very beginning, we wanted to enable our people to communicate with the world, to get the knowledge and to talk to the world. But we also wanted, from the very beginning, to put them in a position of information providers. To explain what they do, to put what they do at the disposal of everybody in Croatia and the world. For this purpose you need a multiuser multitasking computer.

We had to go one step further, and we have purchased equipment for eighteen new institutions—UNIX workstations, communication equipment, communication lines. The effect is at the end of this year we'll have installed one hundred institutions, which is half of the community. Those institutions include 70% of the active researchers, avout seven thousand of them, and they all have the ability to communicate.

The technology that we decided to use was also something new in Europe. For two years Europe was trying to establish scientific and research networking based on X25 protocol and the OSI suite of protocols. Those are great things, great future things, but nothing today. We don't have enough products, and they are very expensive.

In contrast, we looked around at what's available in the world, and we decided that we had to adopt two standards in developing our network. One is the UNIX operating system on all network nodes, major network nodes, and nodes in institutions. And a second is the TCP/IP protocol, because it allows you to forget about the boundaries of local and global networks. You can communicate in the same way with a computer in the next room as well as a computer on the next continent. This is seamless communications, for the user and for the application.

PUBLISHING WITH GOPHER

So this is what we have today. TCP/IP protocols are very interesting because new services are coming every day. One of the most important new technologies and services that came up in the last year is something called Gopher Distributed Information Service. That is extremely important for Croatia, because it enables our users, many of them being novices in computer technology, to prepare information about what they do, the results of their work, lists of people who work on projects—to prepare everything in a very simple way. To prepare simple ASCII files put in a hierarchy of directories, which can be viewed from the whole of the world.

Two days ago I went to a conference in Washington on CD-ROMs and online information services. A lady ran into me and, seeing my badge, said, "Oh, you are from Zagreb. You have an excellent gopher."

Of course it is not that excellent, but she was surprised, navigating through the network, to find something like this in gopher.

Our policy is that each and every institution has to establish a gopher server, from the very beginning, explaining to the world what they do and exporting their results. All gopher servers are in the Croatian language as well as in English.

The whole effort, the whole enterprise, the whole activity called Croatian Academic and Research Network, CARNET, has been financed and organized by the ministry of science and technology. It was actually done by a small group of very young people, not more than ten of them. It was done purely with our knowledge—we didn't have a single hour of course work taken abroad, or any Western expert coming to Croatia, telling us how to do things, because we didn't have money and time. It was done with only two books on networking. It was funded completely with our money.

WAR AND INFORMATION

Mr. Toffler [Alvin Toffler spoke the previous day at the conference] has given us a very simple, brief, clear, and crisp explanation of what is going on ex-Yugoslavia, why the war has started, in *War and Anti-War*. The basics are that somebody wanted to remain in power, and to have the wealth of others at his own disposal. They had very powerful tools—first of all, media. For years they have used media to mobilize the nation into violence.

Mr. Toffler gave us a very good recipe what should be done in such circumstances, in such countries. The West should invest, if really the West wants to do something, in communications, in media, bringing some other ideas and fresh news to those people, to understand what is really going on in the world.

I believe that doing this, computer networks have a specially important role, a specially important place. Why is it so? The changes in such countries, where we have violence, we have ideas of imperialism or whatever else—those ideas can be changed only by the intellectual elite in those countries. To bring computer networks to that elite is extremely inexpensive. It is extremely cheap.

Computer networks have one very important property in comparison to all other communication media. And this is, if you're going to publish your article in newspaper, regardless of how many opposition newspapers you have or independent TV stations or radio stations, you have to go to the editor and convince that your idea is worth telling to others. And even then you can reach only very limited amount of people, usually limited to some geographical area. Computer network allows you to send your message instantly, without asking anybody, to thousands and tens of thousands of people in the world,

continued on page 319

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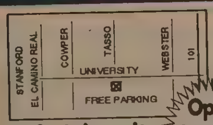

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3COM Tokenlink III 16/4/10-Pk	471/4,478
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IBM Token Ring 16/4 Adapter II	553
INTEL Token Express ISA 16/4	372
INTEL Token Express EISA/32	622
SMC Token Ring Elite Adapter 16/4/12-pack	270/2,900

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NATIONAL SEMI PCMCIA Ethernet Adapter	189
Additional Media Coupler for Thin/10BT	79
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SOLOTEK Wireless ISA Kit (2 cards)	1,494
PCMCIA Wireless Adapter	674
ISA Wireless Adapter	652
XIRCOM NetWave Access Point	822
NetWave PCMCIA or Pocket Adapter	410

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ASANTE 8-Port Concentrator/12-Ports	255/518
ALLIED TELESIS 8 Port/12 Port	316/560
EXOS/MICRODYNE 16 ports	648
INTEL Int. TPE 12 port Hub ISA/EISA	599/679
INTEL Hub Expansion Board (12 add'l ports)	519
SYNOPTICS 2800A 16 port w/ AUI	734
SMC 3608TP 8-Port/12-port Concentrator	356/646
Elite 4000C TR Mau 8-port/16-port	723/1,153
MADGE 8 Station Token Ring Hub	490
3COM Linkbuilder TR 3C510180	1,873

SNMP Manageable Concentrators

ASANTE 1012 12 ports Hub	925
1701 12 Ports w/SNMP module	1,065
SNMP Module for 1012	289
ALLIED TELESIS 12 ports w/SNMP module	1,186
3COM Linkbuilder FMS TP Hub-12 ports	685
Linkbuilder FMS TP Hub-24 ports	1,200
DAVID SYSTEMS ExpressNet 12-port w/SNMP	1,248
HEWLETT PACKARD Advanced Stack 12-port	995
Advanced Stack 24-port	1,560
Advanced Stack 48-port	2,600
Advanced Stack SNMP module	636
Ether Twist/12 ports	834
Ether Twist 24 ports/48 ports	2,090/2,673
NETWORTH 3/6/10 Slot Chassis	642/836/1,933
12 Port 10BaseT Module/Smart Module	1,234/1,791
PowerPipes Ethernet/FDDI Switching Hub	7,487
SYNOPTICS 2803 16 ports w/AUI	808
2804 16 ports w/Fiber Optics	1,177
2814-04/2814-05 16 ports	2,135/1,693
3000N 12 Slot Chassis	1,814
3308A 12 Port module	1,182
3314A-03 Mgmt. module w/ basic SNMP	2,064
3314A-04 Mgmt. module w/ advance SNMP	3,266

Repeaters

CANARY Dual-Port Repeater BNC/BNC	492
Dual Port Repeater BNC/RJ-45	446
TUT Systems XL1501 (Single unit)	1,029
XL600+ 600' Repeater (1 Pair)	500
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ARCserve v5.01 NLM 5/10/25 users	254/510/890
ARCserve v5.01 50/100/250 users	1,082/1,181/1,536
ARCserve v5.01 500/1000	2,982/5,934
MacAgent/SCO Unix Option	330/337
Changer Option for v5.0	465
Stacker Option	470
PALINDROME Backup Director NLM	569
Network Archivist NLM	1,224
Expansion Module (Doubles Capacity)	576
Archivist Autoloader	575
Archivist Enhanced Autoloader	1,445
LEGATO NetWorker (Single Server)	555
COLORADO 2 GB SCSI Tape Drive w/Ctrl	1,055
Power Tape Ext-25 2 GB SCSI Tape Drive w/Ctrl.	1,251
Power Tape 50-4 GB SCSI Tape Drive w/Ctrl	1,664
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CONNER Backup Exec NetWare 3.X/4.X NLM	658
Conner 7251QI 500 MB	520

Novell Software

Lan WorkPlace for DOS Single/10 Users	290/1,445
Lan Workplace for Mac Single/10 Users	289/1,437
Lan WorkGroup-5/10/20 Users	1,125/1,866/2,613
NetWare for Mac v3.12 200 Users	685
NetWare for Mac v4.0 Unlimited	851
Multiprotocol Router	720
Multiprotocol Router Plus	1,032
NetWare NFS Single/5-pk	3,374/10,537
NetWare NFS Starter Kit	1,065
NetWare NFS Gateway 5/10 User	1,069/1,797
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Global MHS v2.0 50/100 Users	648/1,064
MHS v1.5 Network Edition 10 Users	140
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NSSI Net-UPS 600 for Novell/Unix	471
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Lan Access 4MB/8MB	1,391/1,542
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DeskPorte Fast 28.8 (v.FAST) w/Carbon Copy	576
MICRODYNE ACS for NetWare Connect	
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MICROTEST Ethernet LANModem	1,439
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U.S. ROBOTICS Modem Sharing Kit V32BIS	532
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LANPress THIN/10BT (1PAR/1SER)	362
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INTEL Netport II for Ethernet	396
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XIRCOM Print Server 1 LPT, BNC /10BT	300/333
Token Ring Print Server	580

Network CD-ROM

MERIDIAN CD-Net for DOS v4.31 (10 Users)	467
CD-Net for DOS v4.6 (10 Users/WAN)	648
CD-Net for NetWare (NLM-10 Users)	467
CD-Net for NetWare (100 Users)	938
CD-Net for NetWare (250 Users)	1,445
MICRO DESIGN SCSI Express for NetWare, MDI	564
SCSI Express for NW 2.X	470
SCSI Express for NW3.11, Non-MDI(20 Users)	977
SCSI Express for NW3.11, Non-MDI(250 Users)	1,429
CD-Rom LaserBank 600CD INT/EXT	552/665

Network Management

3COM Transcend LinkWatch Software	286
ASANTE View for Windows (In-Band/Out-of-Band)	710
CHEYENNE Monitrix Network Mgmt.	583
FRYE NetWare Management	339
HEWLETT PACKARD OpenView Interconnect	2,723
OpenView Workgroup Manager	1,420
INTEL LanDesk Manager v 1.5	1,070
LanDesk SNMP Gateway	569
LanDesk Response	712
NOVELL Lanalyzer for Windows v2.0	1,055
NetWare Management System	1,692
NetWare Management Agent (Single)	338
NetWare Management Agent 20-pack	5,382
NetWare Management Agent 100-pack	22,000
NetWare LANalyzer Agent v1.0 (Single)	1,008
NetWare LANalyzer Agent (Multiple Segment)	1,692
SABER Lan Workstation 1st node/add 1	129/39
SMC Elite View v3.0 Software	133

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RJ-45 Crimper	45
RG58 Ethernet BNC-Crimp (100 pak)	125
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MT310 TP/COAX Scanner	1,142
MT350 Value Kit	1,877
MT350 NEXT Scanner	2,525
Penta Scanner	2,914

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3COM NetBuilder Local Ethernet	3,637
NetBuilder Remote	5,146
ROCKWELL NetHopper NH-1	1,316
NetHopper NH-3	2,248
NetHopper NH-P	1,118

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Remote	210
Remote Import/Export	95
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Link to SMTP v2.0	2,592
Link to UUCP v2.0	384
MICROSOFT PC Mail v3.0 Server + 10 Users	677
PC Mail 5/20/100 Users	273/930/3,633
MHS Gateway/PROFS	708/3,405
SMTP/X400 Gateway	3,405/3,405
FAX Gateway	1,419

Network Utilities

BRIGHTWORKS Utilities for NetWare	359
Fusion Software 100-User	1,164
Automatic Inventory 100-User/250 User	534/763
CENTRAL POINT Anti-Virus for NetWare	889
Xtree Tools for Networks/Server Extension	565/442
Xtree Xtnet for NetWare	387
CHANTAL RAID (Software Only)	640
CHEYENNE InocuLAN (20/250 workstations)	326/655
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INTEGRA Oasas RAID (Software Only)	535
INTEL LanDesk Virus Protect (Single)	696
LanDesk Virus Protect 4-pk/20-pk	2,070/6,757
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MICROTEST Lan Assist/Map Assist	265/360
SYMANTEC Norton Admin. 5/10 Users	247/438
Norton Admin. 25/50/100 Users	1,068/2,028/3,680

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CASTELLE FaxPress 1 or 2 Line,BNC or TR	1,526
FaxPress 2000 4-Line	3,493
CHEYENNE FaxServe VAP/NLM	655
OPTUS FACSys Fax Software/Multi-Server	720/1,624
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Starter Kit (1 Server, 2 nodes)	270

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Noderunner/SI Coax or TP	124
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Noderunner/SI Coax/TP (5 pack)	423/440
Lantastic for MAC	589
Lantastic for TCP/IP Single/5 Pk	220/883
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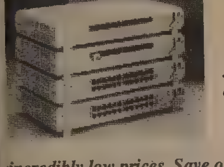

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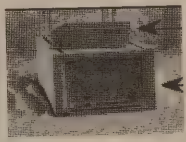

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Sifting Through The

Usenet

With The

Netnews Filtering Service

(Or, Stanford 1, Savetz 0)

BY KEVIN SAVETZ

The Usenet is the world's largest distributed bulletin board system, shared by millions of people using hundreds of thousands of computers scattered along the Internet highway. At last count, there were over seven thousand Usenet "newsgroups," or discussion topics, covering every subject imaginable. Folks on the Usenet talk about everything you can think of, from square dancing to motorcycle maintenance, from the Swedish Chef to Ronald Reagan.

With so much going on on the Usenet, it had been impossible to keep abreast of it all. The best you could do was pick out the newsgroups that most interested you, read them as regularly as possible, and try not to let the ever-prolific Usenet keep you away from more important things, like regular meals. The biggest problem was you couldn't search all the newsgroups at once for the information that most interested you.

This changed in February with the introduction of the Stanford Netnews Filtering Service, the niftiest Internet hack in...well, in at least a month.

HOW IT WORKS

The Stanford Netnews Filtering Service is a tool for creating personalized delivery of Usenet news. You subscribe to the service by establishing "profiles" that describe your interests. The Filtering Service scans the vast quantity of goodies posted each day to the Usenet and emails you the articles that contain information you are interested in.

The best part is that this automated program searches all newsgroups (well, all those available at stanford.edu) for interesting articles. For instance, if you're interested in UFOs, and a conversation about them should pop up in the newsgroup "alt.fan.laurie-anderson" (an altogether unlikely place for such a conversation, admittedly), the filtering service will be sure you won't miss out, even if you don't normally read about Laurie Anderson.

Profiles are simple to set up because you just feed the filter plain English text, without boolean "ands," "ors," or "nots." For instance, you might search for "object-oriented programming" or "nba golden state warriors basketball." Based on the statistical distributions of the words in articles posted to the Usenet, each article is scored to evaluate how relevant it is to your profile. Articles that are deemed to be interesting to you are emailed to you.

> For instance, if you're interested in UFOs, and a conversation about them should pop up in the newsgroup "alt.fan.laurie-anderson," the filtering service will be sure you won't miss out, even if you don't normally read about Laurie Anderson.

The service is rather robust; after you receive useful articles, you can feed the best ones back to the service to improve its search strategy. You can also adjust the frequency of delivery, the volume of articles and the length of your subscription to each profile.

A TRUE STORY

The following story is true. Only the names have been changed to protect the guilty. Once I discovered the Filtering Service, I entered a search for "Negativland" (an alternative music group out of Berkeley). I try to keep up with Negativland's exploits by reading "rec.music.alternative," but frankly, nothing else on that newsgroup interests me at all.

So I told the filtering service to look for articles about Negativland, set the search time limit for the rest of eternity, and happily waited. The following morning, two articles mentioning Negativland arrived in my email box. With a spring in my step, I unsubscribed from rec.music.alternative, content in the knowledge that I would remain informed about Negativland.

So far, so good. For my next trick, I started a news filter on the word "Savetz," my own last name. Throwing modesty to the wind, I decided that if anyone was talking about me, I ought to know about it.

It seems there's an obscure newsgroup called "air.unix". Its distribution is limited to a few computers on the second floor of Sweet Hall at Stanford University. It also seems that the Usenet Filter, since it lives at Stanford,

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Kevin Savetz is currently working on his first book, Your Internet Consultant—The FAQS of Life Online, *due in June from Sams Publishing. His email address is Savetz@rahul.net.*

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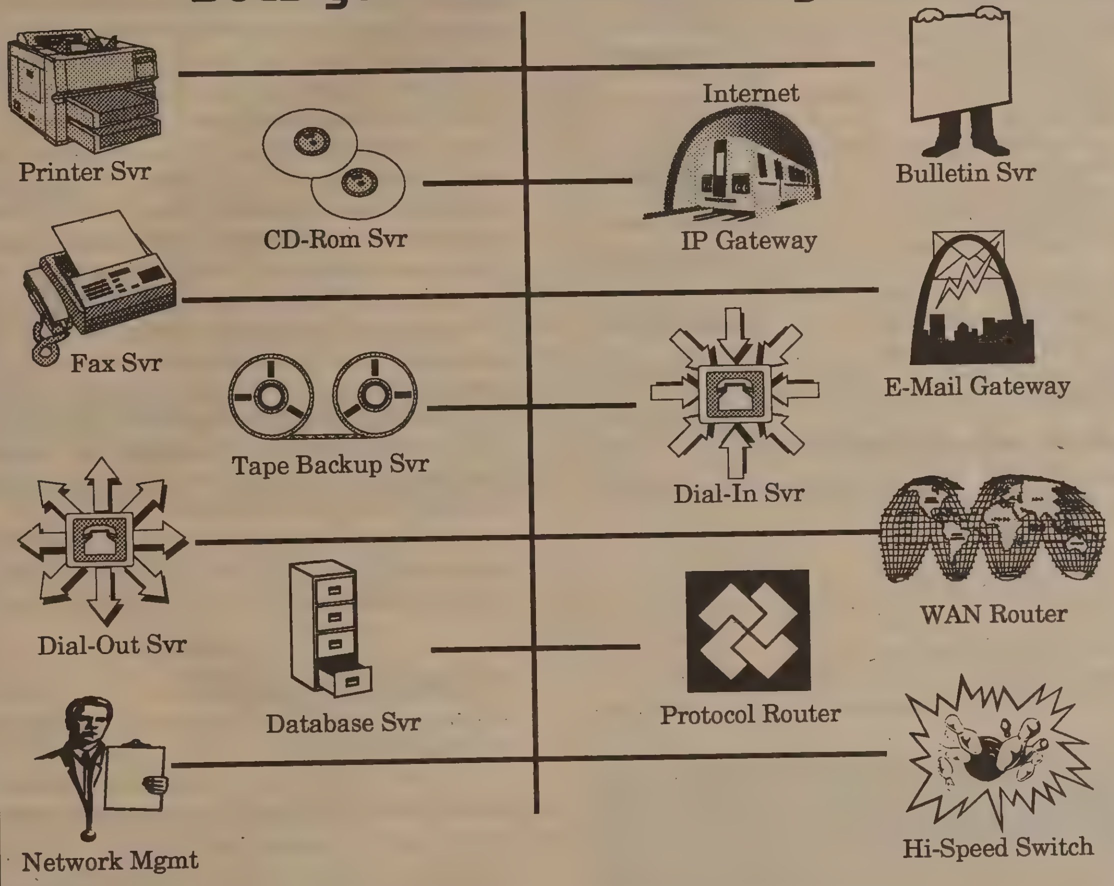
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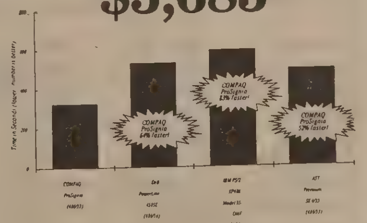

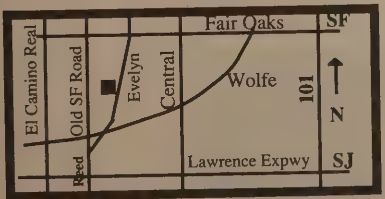
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can see "air.unix" and filter its articles, even though I, being a non-Stanford person, cannot. And, it seems that indeed, someone there was talking about me.

A woman at Stanford posted a message on "air.unix" asking how to send a fax from the Internet. Another soul, ever-helpful (although misguided about US copyright law), posted to the newsgroup the entire text of "Faxing on the Internet," an article I wrote for the February 7 issue of *MicroTimes.* He typed the entire fourteen hundred-word article in himself—I can only suppose to impress the woman who asked the question in the first place.

The Usenet Filter dutifully perused the article, found my name therein, and emailed it to me. To make a long story short (is it too late?), I told the "air.unix" folks a little about copyright law and gave them even more information about sending faxes from the Internet. I also told them about the Stanford Usenet Filtering Service, and explained that I had found their article because it contained my name. Were they grateful? Apparently not.

The next morning, I discovered that the filtering service was sending me lots of articles that I didn't care about at all. They didn't seem to be about Negativland and they didn't seem to mention me. This threw me for a loop, until I realized that every post from one of those wacky "air.unix" readers concluded with a phrase like "This line is just here so Kevin Savetz has to read this message." Ouch. Final score: Stanford, one. Me, zero.

There are two morals to this story. First, don't tell anyone if you use the filtering service to look for your own name. Second (and more importantly) please use the Internet only for good, not evil. ■

* * *

TO ACCESS THE SERVICE...

You can access the service from Mosaic: http://woodstock.stanford.edu:2000 .

The service also supports email access. To get the instructions on the email interface, send a message with the word "help" in the message body to netnews@db.stanford.edu .

Here is an example to give you some ideas of how the service works. Say you subscribe to the service with the profile "online information services." Then periodically you will receive email messages like this:

```
Subscription 1: online information services
 Article: misc.activism.progressive.11965
 From: hn0003@handsnet.org
 Subject: HandsNet WEEKLY DIGEST 1/15-21
 Score: 84
 First 15 lines:
 HANDSNET WEEKLY DIGEST January 15 - 21, 1994
 News from HandsNet's Information Forums
 HandsNet is a national, nonprofit network connecting
organizations working on social and economic justice
issues. Members use HandsNet to make new contacts,
work collaboratively and to find and publish informa-
tion, news ....
 Article: ca.politics.38420
 From: rlm@helen.surfcty.com (Robert L. McMillin)
 Subject: GOV-ACCESS #5:Cal.Emergency Svcs.online +
Net-fax + MINN Pub
Info Net
 Score: 82
 First 15 lines:
 Jan. 22, 1994
 CALIFORNIA OFFICE OF EMERGENCY SERVICES INFO AVAIL-
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 <a recent exchange of messages>
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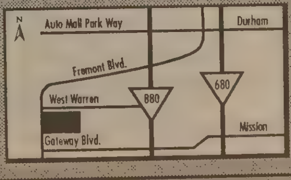

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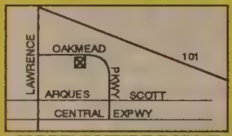

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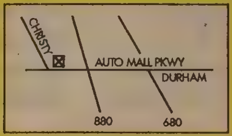

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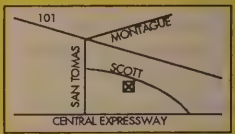

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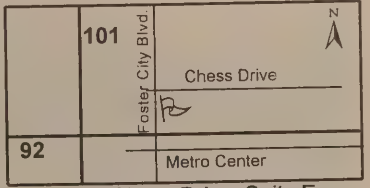

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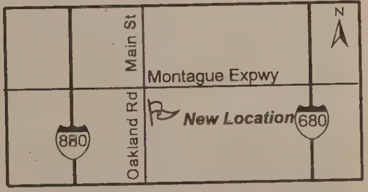

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Plugging In In East Palo Alto

After-School Program Helps Equalize Access To The Info Highway

BY JIRI WEISS, JR.

A large color monitor displays a color image of the Stanford University campus superimposed with some half a dozen kids' drawings. Here sits a bird on a nest, there a Superman-like being hangs in space and, next to him, a flying saucer.

"The drawings are icons, though they don't look like it," explains David Lenn, who spends hours each week coaching fourth, fifth, and sixth graders developing the multimedia exploration of university life as part of an unusual Bay Area after-school program called Plugged In.

Click on the bird on a nest—actually Stanford's mascot, the Cardinal—to explore dorm life through photographs of students in their rooms, with voice-overs answering such questions as "Are boys allowed in the girls' rooms?" and "Are parents allowed to visit?" Click on the Superman and get an animation of two birds kissing.

"It's the kids who decide what interests them," Lenn continues. "We provide the support."

That the entire project was entirely thought up and controlled by kids becomes even clearer when you realize that precious little of the program is devoted to academics. The Superman-like figure that dominates the screen represents a section on "what college kids do for fun." Even college finances—represented by a stealthy-looking man with a bag of money over his shoulder and a handful of greenbacks—are more prominent than the academic section. (The icon for that is located in the far left bottom corner: a freckled nerdy little kid in a red sweater with a big "S.")

"Kids are not so interested in knowing how hard you have to study," says Lenn, almost apologetically.

MAKING A DIFFERENCE

Silicon Valley is full of computer-smart kids, so young teens using the latest in multimedia technology—including scanners, image editing programs, and digital video—would not be all that remarkable if the kids were not from the Peninsula's poor neighborhoods, where computers in the home are as rare as a college education.

Plugged In runs out of a small store converted into an office in East Palo Alto's "Whiskey Gulch"—an area where you'd better chain the hood of your car shut at night if you don't want the battery to disappear. The one-and-half-year-old program serves kids ages 4 to 12— some five hundred have worked with the program's largely volunteer staff so far.

Plugged In is the brainchild of Bart Decrem, a 26-year-old pale and bespectacled Belgian who volunteered with San Francisco's Glide Memorial Church's computer program for the underprivileged while he was at Stanford Law School. Decrem was so energized by the experience that he decided to continue to work with kids and computers rather than studying for his bar exam.

Decrem and Lenn started by teaching more traditional computer literacy courses at the Menlo Park and Redwood City Boys and Girls Clubs, but their goal was to go beyond merely teaching computer skills to large classrooms.

LEARNING AND EXCITEMENT

Plugged In multimedia projects—which have documented everything from what kids learned at space camp to the effects of drugs on their communities—are designed to teach such basic skills as writing, planning, interviewing, and working in groups. "The technology really comes into it about half-way through the process," Lenn says.

For the Stanford project, the kids had to write detailed proposals and story boards which line the computer room walls; prepare their questions; and, in a day-long field trip, interview a couple of dozen college students and take photographs before ever sitting down at the computer. The attention kids receive is personalized and focused.

Plugged In uses leading-edge technology as a way of adding excitement to the learning process. Recently groups of kids in Redwood City and East Palo Alto collaborated to write stories via a high-speed digital ISDN link and a screen sharing program; Plugged In was the first educational organization anywhere to use Kodak's Portfolio Photo CD as a tool for story telling, a feat that won them an award at this year's Multimedia Expo. Kodak is now using the images the kids created for its commercials.

Other types of projects have included *Kidz Stuff*, a desktop-published magazine, and an interactive version called *Young Thang*. Careen McGraw, the 12-year old who wrote the magazine's popular romantic advice columns, has since had her columns broadcast on cable radio.

Plugged In kids are also busy on the Internet, discussing such weighty issues as whether fifth and sixth graders should be allowed to attend seventh grade dances.

Decrem did not want the program to be

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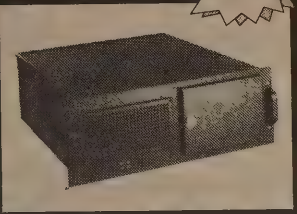

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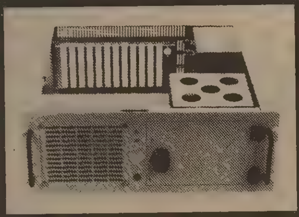

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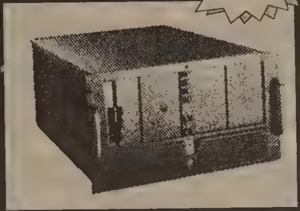

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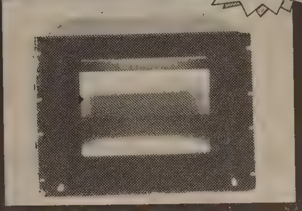

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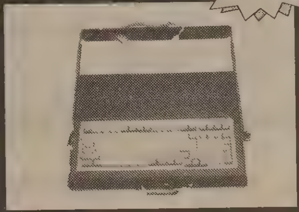

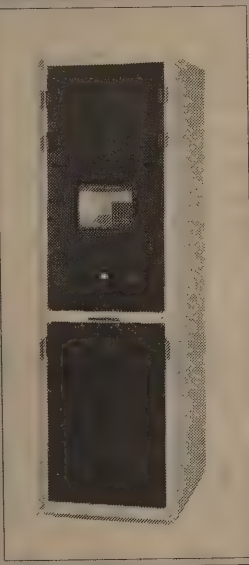

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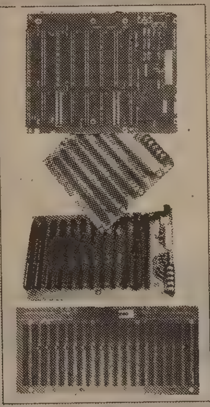

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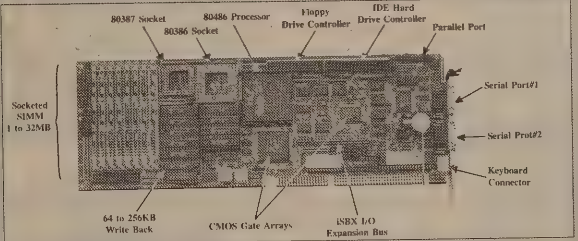

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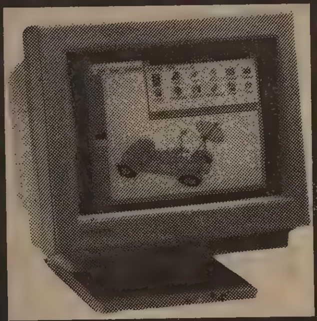

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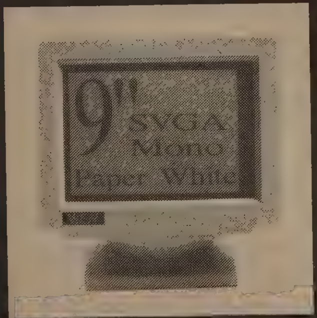

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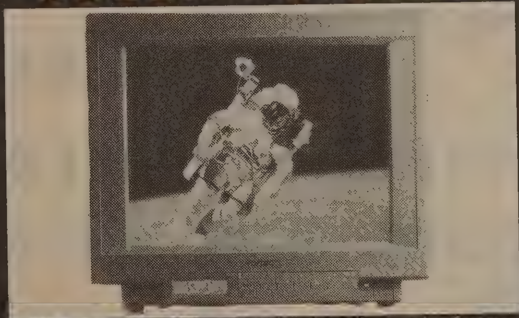

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another "white kids go to the 'hood and tell everybody what to do" kind of program, so he is making sure that it involves the community at large. Next year he plans to involve parents as well in a project to document family histories.

Yolanda Bowie, an African-American mother of five who has lived in Palo Alto most of her life, says she was suspicious at first when she heard about the program through her daughter. She thought that it was just another group trying to get grants for themselves without offering anything in return. Now she works Silicon Valley hours as Plugged In's Development Coordinator.

"I did have some prejudice [against Decrem]...that is how I was brought up," she says. All that has changed. Plugged In is empowering her community, she says.

Bowie worked as an engineer's aide for computer assembly, but didn't know anything about how computers actually worked until she got involved with Plugged In. Now she feels she has a good handle on the computer industry, something everyone in East Palo Alto needs so they are not marginalized from the increasingly hi-tech world, she says. "If I hadn't gotten involved with Plugged In, I would still be left out."

PLUGGED IN

USES LEADING-EDGE TECHNOLOGY AS A WAY OF ADDING EXCITEMENT TO THE LEARNING PROCESS.

Plugged In was started with donations of both equipment and money from some forty-five corporate sponsors, including Adobe Systems, Apple Computer, Cisco Systems, Gold Disk, NEC, and Radius. Still, the organization can afford the salaries of only three staff members. It relies on a database of some three hundred volunteers, who do everything from teaching computer classes to setting up LANs.

The idea is to build up a large database of skilled Silicon Valley professionals who will be willing to donate their time even a few hours at a time, Decrem says. "This organization is informal, so anyone willing to get involved in whatever capacity is welcome." (Plugged In, 1923 University Ave., East Palo Alto, CA 94303. 415/322-1134, fax 415/322-9042. Email: pluggedin@aol.com) ■

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486DX2-66/256K CACHE VLB	$457	$617	$977	$1127	$1217	$1257	$1307
486DX-50/256K CACHE VLB	407	557	927	1077	1168	1207	1257
486DX-50/256K CACHE VLB	327	489	847	997	1087	1137	1187
486DX-40/256K CACHE VLB	307	467	827	977	1067	1117	1167
486DX-33/256K CACHE VLB	287	447	807	957	1047	1097	1147
486SX-33/256K CACHE VLB	199	357	717	867	957	1007	1057
486SLC2-66/64K CACHE VLB	249	407	767	917	1007	1057	1107
486SLC2-66 ISA	187	347	707	857	947	997	1047
486DLC-40/128K CACHE ISA	147	307	667	817	907	957	1007
486DLC-33/128K CACHE ISA	129	287	647	727	897	937	987
486DX-40/128K CACHE ISA	87	247	607	757	847	897	947
386SX-40 ISA	67	227	587	737	827	877	927

BASIC SYSTEM CONFIGURATION

Motherboard & CPU, 1 MB Memory, Cache Memory, Deluxe Mini-Tower Case w/Power Supply, 101 Enhanced Keyboard, 1.44 MB Floppy, IDE/IO Controller w/2HD/2FD/2S/1P/1G

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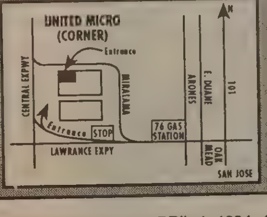

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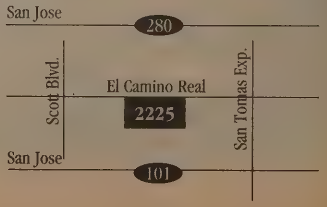

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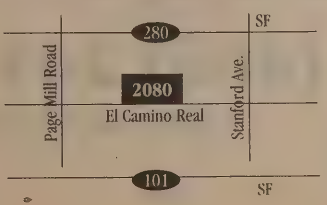

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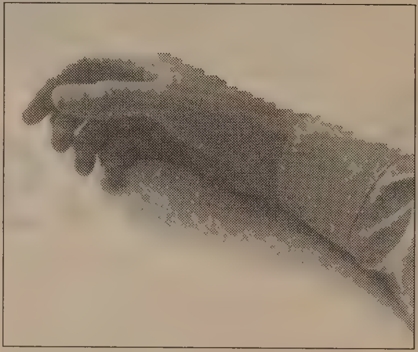
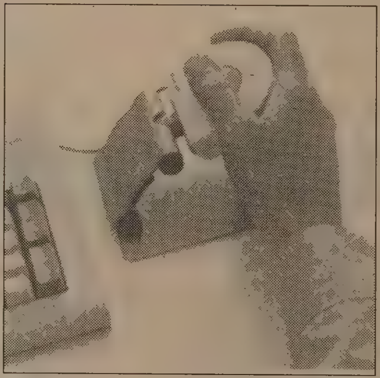


The relaxed hand - the most natural, stress-free position your hand can take. Wouldn't it be great if you could work with your hand in this position? Well, now you can...

with the Desktop Stand for Microsoft Ballpoint



The Desktop stand is ergonomically designed to cradle the Ballpoint mouse and your hand. Its form fits it function. Whether you use the Ballpoint mouse in your right or left hand, and whether your hand is big or small (or somewhere in between), the desktop stand is right for you. It's fully adjustable and that means more comfort as you work.

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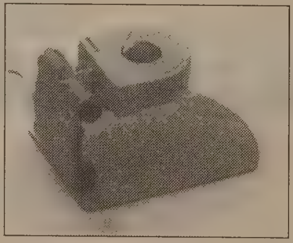
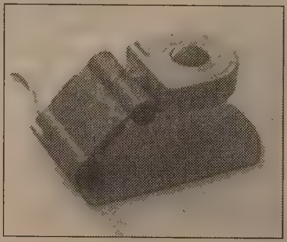
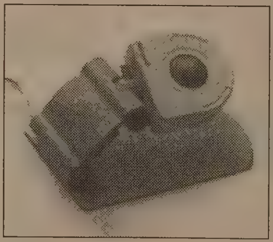


Tilt...



Swivel!



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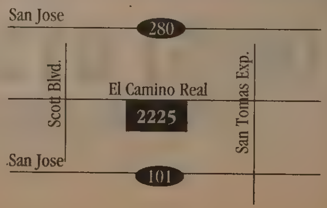

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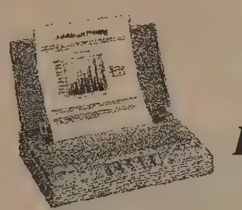

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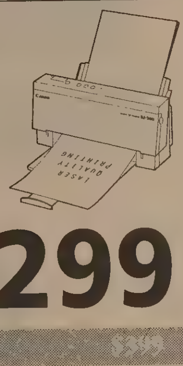

- 360dpi resolution
- Prints up to 248cps
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- 7 resident fonts
- Hold up to 10 envelopes
- 2 Year Warranty

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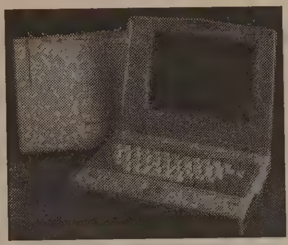

innova 486TXC 25
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Active Color!

- 4MB RAM
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- DOS & Windows preinstalled
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- One year limited warranty

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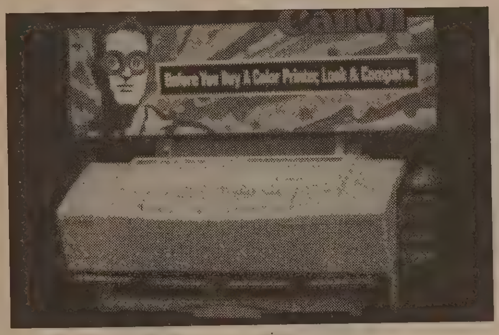

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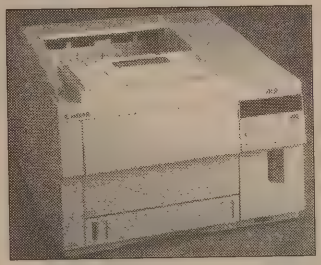

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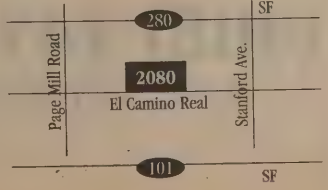

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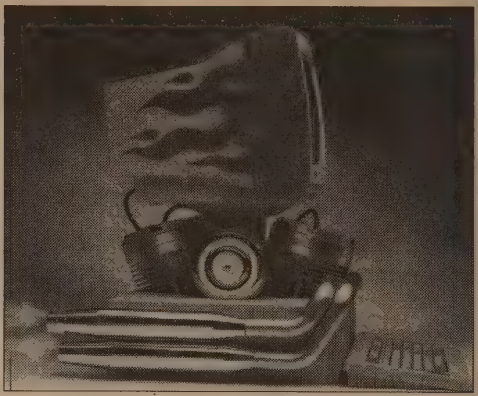

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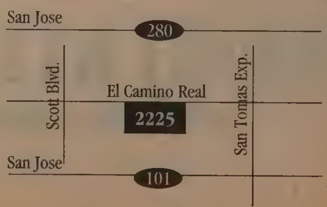

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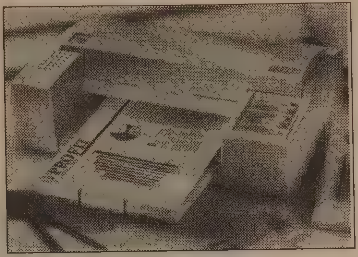

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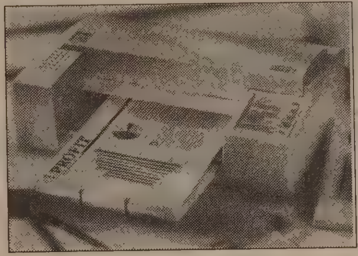

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- Fast 150cps
- 7 typefaces with 4 scalable fonts
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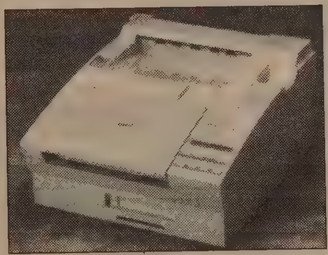

- 6ppm
- 1MB RAM exp to 5MB
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- 1 cartridge slot
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- HP III/IIIsi, PCL-5 emulation
- 2 year warranty

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AP3250		$179
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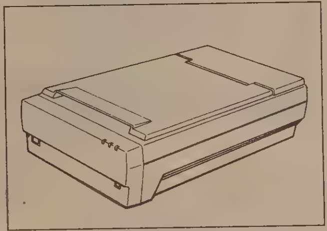

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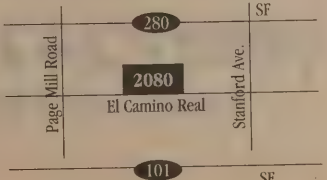

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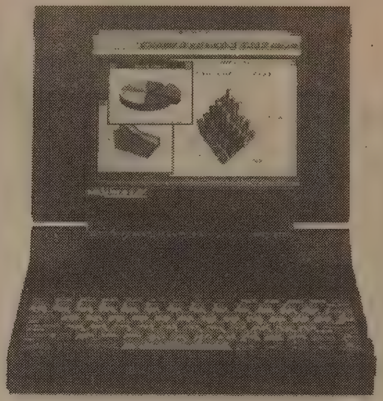
486DX2-50 MHz COLOR!



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- 2 Type II PCMCIA Slots
- MS-DOS & Windows
- Front-Mounted Mouse

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DX2-40	With 120MB HD	$3782
MONO		
DX2-50	With 340MB HD	$3666
DX2-40	With 250MB HD	$2995
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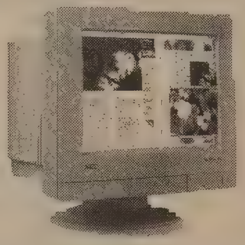

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- 15", .28mm flat square CRT
- 1024x768 at up to 60Hz
- Energy Star compliance
- 3 year warranty

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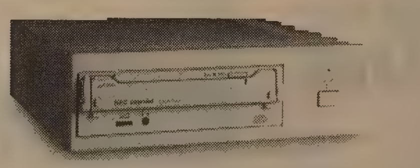

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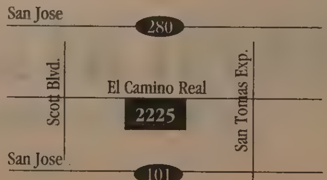

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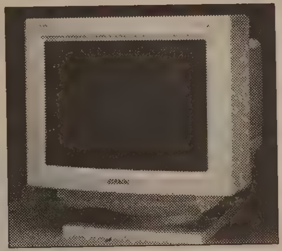

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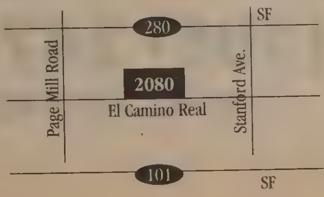

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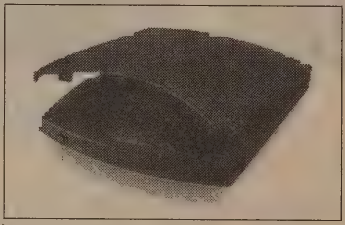

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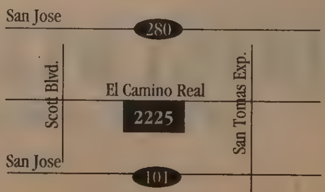

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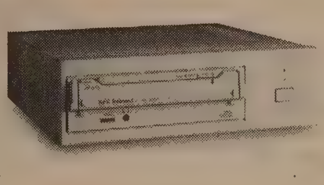

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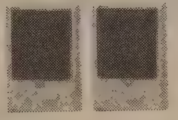

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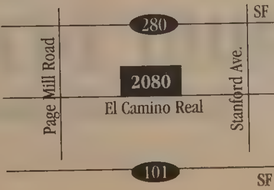

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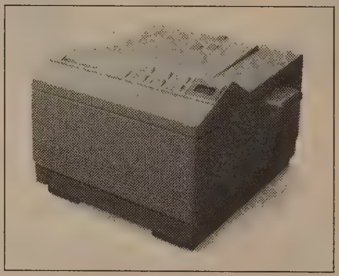

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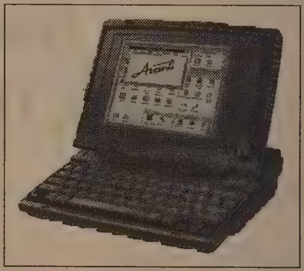

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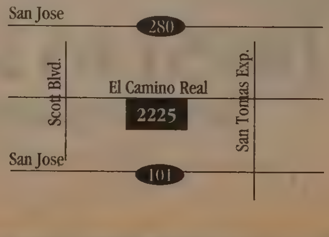

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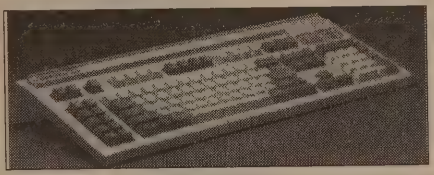

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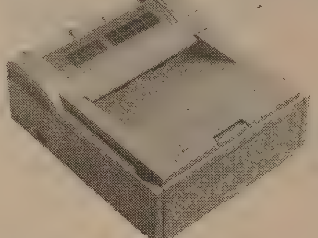

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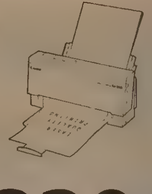

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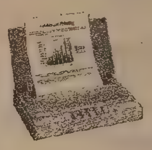

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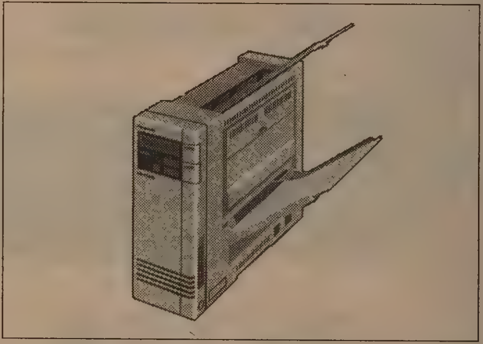

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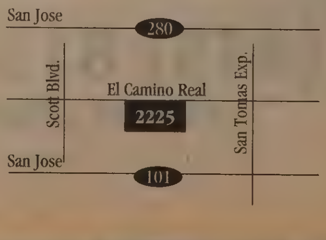

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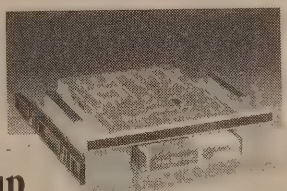

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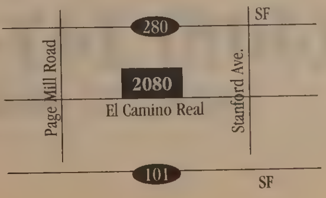

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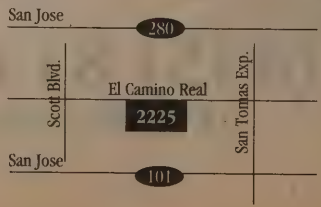

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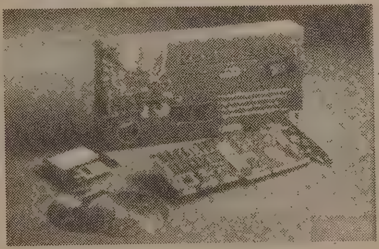

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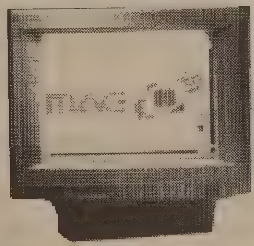

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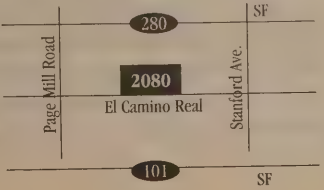

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The Power Mac Glossary Meets The Italian Virus

BY DAVID MORGENSTERN

BMUG

This March seems much like any other year. Reports from spring training games start warming the blood with baseball fever. My nasal membranes swell in perfect synchronization with the hourly rise and fall of the pollen count. And there's the inevitable lineup of new Macintosh models to drool over. There's even a fresh computer virus to help "break in" our data.

But this month's Power Macintosh intro is not the usual cup of tea to even the most jaded of BMUG know-it-alls. Rather, it's the proverbial first-step dawn-of-a-new-age kinda event; a deep breath of air after a two-year nose-pinched wait.

The Power Macs will gift our desktops with greater capabilities, letting systemware and third-party developers continue to shape and evolve the interface. They are chomping at the byte for more power to burn and apply to our workaday applications. Or better yet—games.

BMUG is looking forward to the great new digital toys, but also to new opportunities and challenges in helping and educating users. We will continue to be there for you with the best information, and a friendly word at meetings or online.

LA DOLCE VIRUS

A very nasty virus surfaced in Italy in the first week of March. It's known as INIT 9403 virus, and unlike most other Mac viruses, it is malicious and destructive. The destruction caused by ordinary virii is most often a by-product of their primary action, usually just writing themselves around your hard drive. They make your other applications and system files unreliable or flaky.

After infection, the new virus erases all the hard drives connected to the Mac and tries to mess up the boot volume as well. INIT 9403 doesn't do this immediately, since it would literally kill itself before having the opportunity to infect other systems—not the mark of a really successful virus. It uses timing algorithms that let it wait a while, and after it has spread itself sufficiently, wipe you out.

INIT 9403 appears to have been targeted at online systems and bulletin board operators. There was a report that the virus was first spread by a piece of pirated commercial software. Additionally, the virus alters the Finder and then tries to insert its code into compression and archive utility programs, which are often used to prepare programs for uploading to a BBS.

INIT 9403 is supposed to do its business under the Italian version of the operating system, in both System 6 and 7 flavors. But it also can spread "harmlessly" under US systems. It's always better to be safe than sorry where a virus is concerned!

The freeware anti-virus program, Disinfectant, was quickly upgraded to combat the virus. Unfortunately, it had trouble scanning Enabler files on some Macintosh models running System 7.1, giving an *Unexpected Error Number -192* message. Make sure you have the corrected Disinfectant, Version 3.4.1. It's available on BMUG's online service, Planet BMUG, and from the BMUG office on our Utility V1 disk.

BUILD A POWERFUL VOCABULARY

Before the Power Macintosh actually hits the streets, everyone needs to be brought up to speed on some new terminology that will inevitably be used when talking about the new machines. Here's a byte of an annotated dictionary of new and old Power Mac terms.

CISC 1) A non-cancerous growth. *I went to the doctor's and had the small cisc removed.* 2) Complex instruction-set computing.

Until the new Power Macs hit the streets, CISC processors were the way things got done on most desktop computer systems. The Macintosh used the Motorola 680x0 family of microprocessors, while PCs use Intel 80x86 flavors.

Microprocessor chips do the actual work of a computer by processing instructions and moving data around. These old-fashioned processors have an encyclopedic number of diverse instructions to handle many different tasks. This makes them big and hot—not the good hot-cha-cha, but the roasting marshmallows kind. This is one reason why the CISC Pentium has been so slow at hitting the streets. It was melting some motherboards. Too much of a good thing...

The CISC chips keep getting faster and faster, and better at doing exactly the task that applications require from them. But they may not be as good at giving us all the speed we will need for bigger and better techno-goodies.

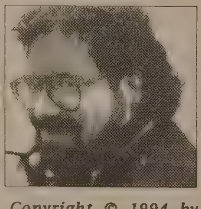
compatibility 1) The recent discovery of hidden parapsychological communication between bread and thin slices of butter. 2) The correct and proper functioning of Macintosh programs on other Macintosh computers. See also emulation, Macintosh, and Power Macintosh.

What works and what doesn't has always been the issue with previous system upgrades and Mac models. But the upcoming Power Macs are the Mothers of all upgrades!

The new computers are Macs in their physical appearance and in their interface, but they are much different, deep down in the nitty-gritty. The issue for users really centers on the functional compatibility of their individual programs, not just simple data or file compatibility.

People want their everyday programs to work. Hopefully, they will even be better on the fancy new machines. Not an unreasonable expectation.

cyber- 1) Long and very heavy wooden pencils used by Scottish programmers. 2) A



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BMUG UPCOMING EVENTS:

April 7	No Main Meeting due to University booking of meeting hall. Sorry!
April 14	No Main Meeting due to University booking of meeting hall. Sorry!
April 18	BMUG South at 1922 The Alameda, United Way Office in San Jose. Photonics (wireless networking stuff); FIT Software Full Contact (personal info manager).
April 21	Global Village New modems and telecomm software; QuickMedia Labs FotoAlbum (digital photo archives).
April 25	BMUG West at Exploratorium Science museum in San Francisco. Demonstrations to be announced.
April 28	Photonics (wireless networking stuff); Apple Power Macs and future sy temwares.

Please Note: BMUG main meetings are held in 22 Warren hall on the UC campus (near University and Oxford). Call the BMUG Announcement Line at (510) 549-2684 ext.8 for the latest news on meetings, special interest groups (SIGs) and seminars. See you there!

prefix pertaining to computers. 3) A prefix smeared all over the popular media, that now has no meaning whatsoever.

Here's a game you can play in the office. Pick up a dictionary and open it to any page. Then look for the best combination of cyberwords you can build. *Cyberferret. Cyberpinworm.* Cool!

emulation 1) An unhealthy affection for flightless birds. 2) How Macintosh programs will run on Power Macs.

As we mentioned before, the new Macs will appear familiar from the outside, but inside they will use the PowerPC processor. Our Macintosh programs were designed to use a flavor 680x0 chip and not the new kid on the block. You can't just say to the CPU, "Do it, why don't you?"

Instead, we will run our programs (and even parts of the operating system) in a software ghetto pretending to be the old Motorola chip. Think of this process as a road—not the data superhighway, please!

A road has certain rules for the driver, and also for the engineer. There are requirements for the asphalt surfaces and the subsurface layers of gravel and concrete. When you cross a bridge, the road appears the same to the driver. But to the engineer, it is entirely different. It's the same way with our Mac programs running on the PowerPC.

Apple says that you shouldn't really be aware of running in emulation, except for experiencing some differences in speed. Some parts of older programs may see speed increases, while others may not. Some of it depends on which Macintosh you had before. If you move up from an older Mac, even the emulation mode will seem snappy.

Apple says that most programs that played by the programming rules will run fine. Your favorite shareware programs may do better than some commercial software, since most shareware authors don't break the Apple's guidelines as often. It's true! Shareware authors just want a program to run. Period. Commercial programs need to run fast, which almost always means breaking the rules.

Macintosh 1) Techno-toaster. 2) See Power Macintosh.

native 1) The opposite of a yes-man. 2) How programs specifically written for the Power Macs will run.

Native applications are designed to live in the PowerPC jungle, and will not have to operate in emulation mode. This means they will run lots faster than non-native versions.

There's no doubt that developers will take the Power Mac intro as a marketing opportunity to get people to move away from their current programs, and over to a new and improved thingamabob. This will mean really great deals on competitive upgrades. Have some fun and try some of the new versions just for fun. Is MS Word really great, or are you just chicken? Cluck-cluck-cluck!

Years ago, my father bought a Chameleon brand computer, that supported both the old CP/M and the then-brand-new MS-DOS operating systems. He thought that he would need CP/M to run the old programs he'd previously written. After the first few months, he found that he never touched the old programs and just used the groovy new stuff.

Going native may be a bad idea for career diplomats and spies, but not for Macintosh explorers.

Power Macintosh 1) Techno-blast furnace. 2) See Macintosh.

PowerPC 1) The national advocacy group for the politically correct. 2) The family of RISC microprocessors developed from the alliance of Apple, IBM, and Motorola. PowerPC chips will make their ways into all kinds of systems, including desktop and portable computers, Newtons, printers, and even automobiles.

RISC 1) The joint connecting the arm and the hand. *"Look at my new riscwatch," said Jane.* 2) Reduced instruction-set computing. Unlike the big CISC processors, RISC chips have lots of small routines that are designed to be performed exceptionally quickly. Supposedly you gain more speed if you really juice-up the most often used instructions, and create less-used ones from parts.

Until now, RISC technology has been found in hard-core number crunching systems, such as workstations and fancy database servers. These computers have generally been based on UNIX, usually needing a semi-guru to install and maintain things.

TIP CITY

- If you've recently moved up to System 7.1 or Pro, you may have noticed more "Not enough memory to keep this window open" messages from the Finder. There is no big secret to the fix—buy more memory! Eight megabytes of RAM aren't enough any more. You didn't see the error messages under System 7.0.1, because it uses less memory. Simple and sorry.

Remember: Weird little things, such as a sudden slowdown of text entry or strange copy and paste behavior, are memory warning signs. Immediately save your work, quit the application, and restart.

- Japan's largest online service, NIFTY-Serve, now provides Internet access, so you can send email to a buddy with an account over there by addressing mail: NIFTY-ID@niftyserve.or.jp .
- A few years ago, I spent a column describing how it's a bad idea to hack Apple's HD SC Setup drive program to format and partition non-Apple hard drives. I regret to say that the hack is making the rounds of the net and BBS systems and people may try it to save a buck.

HD Setup contains a little table of drives that can be easily patched. Apple has been accused of hiding this information, and protecting their drive "secrets." There's no smoking gun, conspiracy, or frozen alien here, I'm afraid. Altering HD Setup is not a good thing to do to your drive and its data!

There are many good third-party drive formatting programs nowadays. Most support every hard drive under the sun and then some. There's a lot of competition between vendors, so the cost isn't too bad. Please don't fool with your data—stick with the professionals on this one.

SHAREWARE SPOTLIGHT

A new addition to the BMUG library is DiskSweeper 1.0 by Jim Speth. It's a utility that restores space used by Desktop files on floppy disks. Perhaps you noticed that a supposedly empty floppy still has space being used, sometimes 10 or 20% of the disk!

The invisible Desktop file grows as you put files on the disk, keeping track of icons and other important information. Unfortunately, it doesn't shrink when you move files to the Trash.

Rebuilding the Desktop used to fix the problem, but since System 7 made the Desktop its own volume, this procedure no longer works on empty disks. You can always reformat the floppy, but this takes forever. With DiskSweeper you can just drag and drop the desktop away. If only losing weight were so easy.

DiskSweeper is available on Planet BMUG, the BMUG BBS. ■

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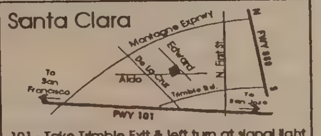

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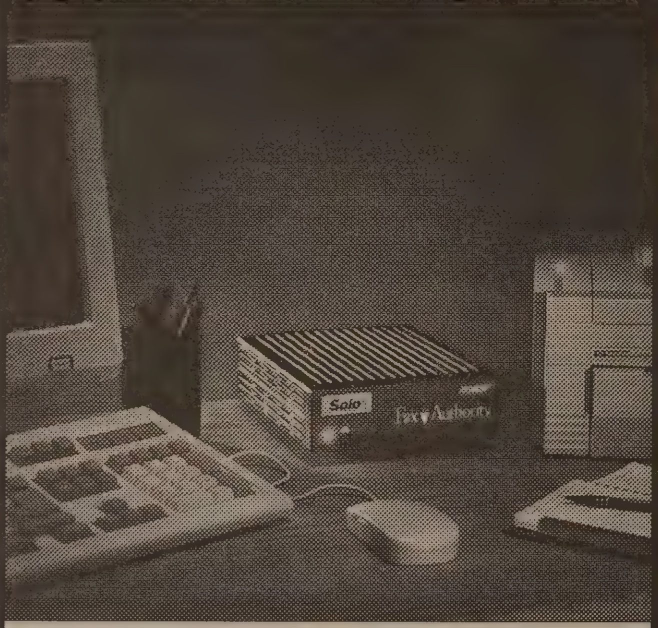

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All Systems Include: Motherboard & CPU, 4MB RAM, 130MB Hard Drive, 1.2 & 1.44 Floppy Drives, Mini-tower or Desktop case w/230W P.S. 2HD/2FDF IDE Controller w/2S/1P/1G Ports, SVGA Card, 14" SVGA Monitor .28dp., 101 Enhanced Keyboard, Serial Mouse & Pad, Microsoft DOS 6.2 and AMI Bios. DOS 6.2, Shareware Software package and AMI BIOS. Free 1-Hour Software Installation.

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What Is BMUG?

BMUG is an educational, nonprofit, consumer advocacy group organized to share information and provide critical direction to users and developers in the computer community worldwide. It is an independent advocate, not affiliated with any manufacturer, delivering trustworthy information and useful products.

Like any growing organization, it is many different things to its fifteen thousand international members. BMUG supports many Special Interest Groups (SIGs), 18-line Planet BMUG and 11-line BMUG Boston BBSes, a software library, weekly meetings, publications, and much more. BMUG also puts out a semi-annual 500+ page book that we call our "newsletter."

Our motto continues to be: *We're in the business of giving away information.*

Come and join in the dialogue at the BMUG main meeting every Thursday evening, 6:30 to 9:30 (or whenever we finish), on the UC campus. BMUG West and BMUG South are monthly meetings held in San Francisco and San Jose. Check the Announcement Line at (510)549-2684 ext. 8.

The BMUG Office, 2055 Center Street (a half block from the BART station), is open to the public 8:30 am to 4:30 pm. Please come by, say hello, and meet other members.

The BMUG Helpline provides volunteer technical assistance and telephonic hand-holding for our members. If your question can't be answered on the spot, we try to get you in touch with someone who can help. Improve your Macintosh education, and help others by becoming a Helpline volunteer!

BMUG has one of the most up-to-date, comprehensive software libraries around with hundreds of disks filled with the latest versions of public domain or shareware programs. BMUG also produces CD-ROM collections, including the digital video *TV-ROM™ Too*, and the *BMUG PD-ROM.*

Planet BMUG and BMUG Boston are graphical user interface FirstClass bulletin board systems, offering the latest in shareware, as well as news, private email, rumors, etc. With our 18-line capability, you can have access to BMUG almost 24 hours a day. It's easy to use, fun, and a great resource.

BMUG can be found on most online services. BMUG can also be reached through the Internet network through UG0001@applelink.apple.com .

To get some further information about BMUG please write to: BMUG, 1442A Walnut Street, #62, Berkeley, CA 94709. If you prefer to phone our business office, call (510)549-BMUG, or fax (510)849-9026.

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- 14,400 FAX MODEM

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- PRO AUDIO SPECTRUM
- 4MB RAM EXP TO 64MB RAM
- 1.2MB AND 1.44MB FLOPPY
- 213MB HARD DRIVE
- SVGA NON-INTERLACED MONITOR
- 2 SERIAL, 1 PARALLEL, 1 GAME PORTS
- WINDOWS ACCELERATOR 32BIT SVGA CARD
- 101 KEYBOARD
- MICROSOFT MOUSE

486DX2-66MHz	$1650
486DX2-50MHz	$1495
486DX-33MHz	$1485

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- 4MB RAM EXP TO 64MB RAM
- 1.2MB AND 1.44MB FLOPPY
- 213MB HARD DRIVE
- SVGA NON-INTERLACED MONITOR
- 2 SERIAL, 1 PARALLEL,1 GAME PORTS
- WINDOWS ACELERATOR 32BIT SVGA CARD
- 101 KEYBOARD
- MICROSOFT MOUSE

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NEC 5FGE 17"	$1060
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MAG MX17F 17"	$870
VIEWSONIC 5E 14"	$352
VIEWSONIC 15 15"	$450
ADI 3E 14"	$265
ADI 4G 15"	$385
ADI 5A 17"	$720
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CONNER TAPE DRIVE 250MB	$148
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1.44MB FLOPPY	$45
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LOGITECH MOUSE	$45
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486DX2-50MHz VLB BUS	$420
486DX-40MHz VLB BUS	$385
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DIAMOND VIPER 2MB	$348
ATI ULTRA PLUS W/1M	$140
ATI ULTRA PRO 2MB	$310

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200MB HARD DRIVE	$195
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imposed on top of the tax you're already paying. The PHC tax rate was recently increased to a bone breaking 39.6%

The penalty is imposed on undistributed earnings received when under contract to furnish personal services if the contract designates a 25% shareholder to perform the services.

Incorporated programmers easily fall prey by specifying in a contract that they, personally, will do the programming. This could spring two tax traps at once. First, as a personal service corporation, you'll step into the highest corporate tax rates in effect that year. Then you'll be slammed by the 39.6% penalty tax on top of that. Instead, specify that "the corporation" will provide the technology or service.

In one case, a taxpayer had a letter stating that "you" agree to do the designated work. The IRS tried to impose the penalty tax. The matter ended up in Tax Court, because it wasn't clear whether the "you" referred to the corporation, or the corporation's owner. In real life, of course, it may be the same set of fingers pushing the keyboard; but in tax land, semantics matter.

The 39.6% penalty tax may also be imposed on "passive" software royalties, even if the software that you develop is sold by some separate retailer. One test to avoid the penalty is that the software-related expenses (not counting your salary) must be at least 25% of the royalties.

BEWARE OF S CORPORATIONS

If all shareholders of a corporation consent to making what's known as a Subchapter S election, the corporation may elect to be taxed similarly to a partnership. If you own less than a controlling interest in a corporation, or are offered shares of an S corporation in payment for your technology or other services, consider carefully before you consent.

When an S election is made, the shareholders, rather than the corporation, are taxed on the corporation's income. When shareholders are close members of one family, problems are usually minimized. But if you own 49% of the outstanding shares, and your former best friend owns the other 51%, you'll wind up paying taxes on income earned by a corporation that you don't control, and the corporation might not even pay you enough of that income to cover the taxes.

DISQUALIFIED USE OF A HOME OFFICE

Let's look at one industrious techie who works hard, but not smart, out of his home. Maynard Slydrhul uses his home-office computer for everything: drafting proposals, contract programming, software development, and even in his fill-in work as a temporary employee.

Computer equipment is subject to special "listed property" rules restricting its deductibility. These rules don't apply if the computer is used exclusively at a regular business establishment and owned or leased by the person operating that establishment.

There's no problem with Slydrhul using the computer for his own business. But his use of it as an employee, even a "temp," will likely cause the computer to become listed property. Furthermore, even limited use of the office in the home by an employee may disqualify the home office deduction altogether, due to additional standards that apply to employees.

OVERLOOKING TAXES AND OTHER OVERHEAD WHEN PRICING SERVICES

There are generally three ways for programmers to be compensated for their services: wages, for employees; payment for services, for independent contractors; or sale of licensing rights, for developers.

If you're an independent contractor, don't underprice yourself. Your compensation must cover not only additional self-employment taxes and benefits, but a mess of other business costs and risks that employees don't carry.

Many software contractors charge just a bit under twice as much as they would make as an employee, and their smart corporate clients pay because a) they understand about the overhead, and b) it's still a bargain for them compared to taking on a regular employee.

Employees working through job shops or similar agencies should generally bargain aggressively. Assignments lasting less than a year usually don't offer the benefits available to comparably situated regular employees, nor does the job shop offer much in the way of job security. These factors should be weighed into your compensation package; stick to your guns.

MAKE APPROPRIATE ELECTIONS FOR RESEARCH EXPENDITURES

If you're a software developer, there's a good chance that you can currently deduct development costs, rather than capitalizing the costs and claiming depreciation only after you bring the product to market. This treatment is an elective method of accounting. If you don't make the election in a timely manner, the deductibility of these costs is restricted. If you've missed the election, you'll need to seek the consent of the IRS to adopt this method in future years.

GET SUFFICIENT PROFESSIONAL ADVICE

For developers or technical specialists, finding the right tax advisor is important. Structuring license and technology development contracts can involve issues spanning many facets of tax law, in addition to various laws and regulations affecting the tax treatment of patents, software, and research expenditures.

You'll probably want a certified public accountant or an attorney, either of which should be a tax specialist—sometimes a client will bring in a contract drafted by a general business lawyer to be "checked over" by their tax accountant, only to find that much of the document would need to be redrafted to take into consideration the tax ramifications.

To protect the public, the State Board of Accountancy and the State Bar impose extensive regulations and restrictions on who may practice and how that practice must be conducted. While an unlicensed tax preparer or an EA (enrolled agent: a non-accountant admitted to practice before the IRS) may have some advanced tax training and experience, they often don't. Moreover, the State doesn't oversee these operations to enforce competency or professional ethics.

Even if a tax preparer is a CPA, if the firm employing him or her is not a CPA firm, registered with the Board, you won't be protected. Insist on an engagement letter and verify with the Board of Accountancy (phone 916/574-2155) that the firm is in good standing. Note that the Yellow Pages permit anyone to list themselves under "Certified Public Accountant," even if the business or individual cannot legally claim to be one.

Noncertified preparers may be appropriate for those individuals whose needs are quite simple and won't justify the relatively heftier fees of a tax attorney or CPA.

Unlike attorneys, CPAs are prohibited from advertising areas of specialization. You can ascertain areas of expertise by inquiring about the practitioner's activities in professional organizations or the topics of his or her published works, or asking a few technology tax-related "test" questions. For attorneys, check their listing in Martindale-Hubbell, a standard reference available at your library.

USE A TAX ORGANIZER

Everyone should use an income tax organizer. Not only is it a useful organizational tool, it also acts as a checklist for commonly encountered items of income and deduction.

Some of my clients use do-it-yourself tax software, such as MacInTax, to organize their individual tax information. This is fine as long as you understand that these packages don't accommodate all of the forms, elections, and options that a more complex tax situation requires.

If you need a 1993 individual, partnership, or corporation tax organizer, a complimentary one can be mailed to you from my office at (510)893-5753. ■

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intel inside

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Acorn Pentium

- Intel Pentium 60MHz CPU
- Genoa PCI motherboard w/256K cache
- Teac 1.44 & 1.2 floppy drives
- 16 meg 60ns RAM
- 420 meg Western Digital 12ms IDE HD
- PCI IDE controller card
- Genoa Phantom PCI Video card w/2 megs
- 17" ADI 1280x1024 NI Low Rad monitor
- Medium tower case

$3390

All Systems Include:

- 250 watt UL power supply
- 2 serial / 1 parallel / 1 game port
- Mini tower or AT case
- 101 Enhanced Keyboard

Acorn CAD/CAM

- Intel 486DX-33/DX2-66
- Genoa VLB motherboard w/256K cache
- Teac 1.44 & 1.2 floppy drives
- 16 megs 70ns RAM
- 340 meg Western Digital 12ms IDE
- 32-Local Bus IDE controller
- High Speed (16550 UART) serial ports
- Diamond Viper VLB w/2MB
- 15" ADI Low Rad 1280x1024 monitor
- Medium tower case

$2425/2625

CUSTOM SYSTEMS

Our Stanford educated technician will help you design a system to fit your specific needs.

Optional System Upgrades

Memory

1 meg of 70ns RAM	add $42
1 meg of 60ns RAM	add $45

Video Cards

Call for various Local Bus and ISA options including Orchid, Diamond and ATI.

Monitors

Call for various monitor options including MAG, NEC, ADI, Sampo and Viewsonic.

Hard Drives

(Upgrade from 170 meg IDE)

210 meg IDE	add $20
250 meg IDE	add $45
340 meg IDE	add $105
420 meg IDE	add $145
540 meg IDE	add $285

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- Intel 486DX-33/DX2-66
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- Teac 1.44 & 1.2 floppy drives
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- 250 meg Western Digital 12ms IDE
- Local Bus IDE controller
- Genoa 8500VL Local Bus video card
- 14" non-interlaced .28 72Hz SVGA monitor
- Double speed CD-ROM 250ms
- Pro Audio Spectrum 16 sound card
- Labtec CS-550 shielded speakers

$1835/2045

Genoa 486-33/66

- Intel 486DX-33/DX2-66
- Genoa VLB motherboard w/256K cache
- Teac 1.44 & 1.2 floppy drives
- 4 megs 70ns RAM
- 210 meg Western Digital 13ms IDE
- Local Bus IDE controller
- Genoa 8500VL Local Bus video card
- 14" non-interlaced .28 72Hz SVGA monitor

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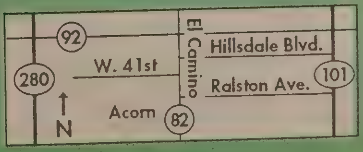

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- UMiracle P5 Pentium PCI 256K Cache Motherboard with 4 PCI's, onbrd NCR SCSI-2, Phoenix Flash BIOS
- 16MB 70ns 72Pin SIMM RAM (8MB x 2pcs)
- IDE I/O 2HD/2FD 2S/1P/1G
- 1.2M & 1.44M TEAC Floppy Drives
- 1.08GB Quantum Fast Wide SCSI-3 LPS1080S HD
- Toshiba XM-3401B SCSI-2 256K CD-ROM
- Diamond Viper PCI 2MB - 85 Million WinMarks
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- Premium Digital Full Tower 250W PS
- 101 Keytronic Keyboard

60Mhz $4375
66MHz $4625

Pushing Technology towards the edge! This ultimate PC brings out all the latest technology you, a power user, can desire. Pentium computing power combined with latest 132MB/sec throughput PCI bus architecture, Fast Wide SCSI-3 Harddrive, High Speed CD-ROM, and the ultimate 85M Winmarks VIPER PCI! No way you can find a PC this powerful, at this price. No way!

UMiracle 486 ISA PCI

- UMiracle 486 PCI 256K Cache Motherboard with 3 PCI's, 4 ISA slots, Intel Saturn ChipSet with onboard NCR PCI SCSI-2 Controller
- 16MB 70ns 72Pin SIMM RAM (8MB x 2pcs)
- IDE I/O 2HD/2FD 2S/1P/1G
- 1.2M & 1.44M TEAC Floppy Drives
- 540MB Quantum Fast Wide SCSI-3 LPS540S HD
- Toshiba XM-3401B SCSI-2 256K CD-ROM
- Diamond Viper PCI 2MB - 85 Million WinMarks
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- Premium Digital Medium Tower 230W PS
- 101 Keytronic Keyboard

READY TO GO

33SX-$3210 50DX/2-$3385
33DX-$3320 66DX/2-$3475
40DX-$3340

Highly recommended by our engineering staff. Our fully integrated PCI motherboard combines PCI SCSI-2 NCR Controller, Phoenix Flash ROM BIOS, 72Pin SIMM upto 128MB. Our thorough testing ensures this PC is perfect and optimized in every aspect - including Fast-Wide SCSI-3 HD capable of 4MB/S substained DTR, Fastest Video, SCSI-2 CD-ROM! Ready for any graphic or scientific intensive work, now and future!

AIR 486 EISA VLB - EI-Line

- 486 AIR-EI EISA 3-Slot VLB 256K Cache Motherboard
- 8MB 70ns 72Pin SIMM RAM (8MB x 1pc)
- QAccess Fast Adaptec 6360 SCSI-2 VLB Controller with VLB IDE, FD and 2S/1P/1G
- 1.2M & 1.44M TEAC Floppy Drives
- 540MB Quantum Fast Wide SCSI-3 LPS540S HD
- Diamond Viper VLB 2MB VRAM Weitek 9000 ChipSet
- KFC 15" 1280x1024NI Multisync Digital Monitor
- Premium Digital Medium Tower 230W PS
- 101 Keytronic Keyboard

33SX-$2331 50DX/2-$2506
33DX-$2441 66DX/2-$2596
40DX-$2461

READY TO GO

8 full EISA bus-mastering slots with 3 VLB extension, memory up to 256MB using 72Pin SIMM, U.S. made quality motherboard. Compare this to AMI or Micronics and you see no reason to spend five hundred dollars for just the name! We add QAccess all-in-one HD and I/O controller, SCSI-3 HD, 15" Flat Screen Digital Controlled Monitor and Viper VLB to make this machine fly even higher!

AIR 486 ISA VLB - MIS-Line

- 486 AIR-MIS ISA VLB 256K Cache Motherboard w/ Integrated Adaptec VLB-SCSI-2, VLB-IDE, I/O
- 8MB 70ns 72Pin SIMM RAM (8MB x 1pc)
- 1.2M & 1.44M TEAC Floppy Drives
- 340MB IDE Quantum LPS340A 128K Cache HD
- Orchid Fahrenheit 1280+ VLB S3-805 ChipSet
- KFC 15" 1280x1024NI Multisync Digital Monitor
- Premium Digital Medium Tower 230W PS
- 101 Keytronic Keyboard

READY TO GO

33SX-$1725 50DX/2-$1900
33DX-$1835 66DX/2-$1990
40DX-$1855

New AIR VLB motherboard with built-in VLB-SCSI-2 featuring Adaptec 6360 Chipset for 100% software support guarantee, VLB IDE & Floppy interface, plus 2S/1P/1G - all built-in quality! We add new Quantum 340MB IDE super-fast harddrive, Orchid Fahrenheit VLB and 15" full screen digital controlled monitor. Another quality state of art from UMiracle!

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- 486 Green AIR-SH ISA 3 Slot VLB 256K Cache Motherboard
- 4MB 70ns SIMM RAM (1MB-30Pinx4)
- Fast VLB 32Bit IDE Controller 2HD/4FD with 2 Hi-Spd 16550 UART I/O & 2.88MB Support
- 1.2M TEAC & 2.88M Toshiba Floppy Drives
- 270MB IDE Quantum 128K Cache Harddrive
- Cirrus Logic 5428 VLB 1MB Windows Accelerator
- KFC 14" 1024X768NI 0.28DP Monitor
- Premium Digital Mini Tower 230W
- 101 Keytronic Keyboard

READY TO GO

33SX-$1211 50DX/2-$1386
33DX-$1321 66DX/2-$1476
40DX-$1341

7 bus-mastering slots with 3 VLB extensions, ZIF socket for easy CPU insertion & removal and future P5 Overdrive support, U.S. made quality motherboard, 2.88M future floppy drive and hi-speed 16550 UART on COM1 & COM2 for smooth serial port transmission, Flash BIOS option. Green Power Managment slows down CPU and monitor when not in use. End up saving you a bundle! Smart choice? Only from UMiracle!

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- 4MB 70ns SIMM RAM (1MB-30Pinx4)
- Fast 32Bit VLB IDE Controller with 2S/1P/1G
- 1.2M & 1.44M TEAC Floppy Drives
- 270MB IDE Quantum LPS270A 128K Cache HD
- Cirrus Logic 5428 VLB 1MB Windows Accelerator
- KFC 14" 1024X768NI 0.28DP Monitor
- Premium Digital Mini Tower 230W PS
- 101 Key Enhanced Keyboard

33SX-$1129 50DX/2-$1304
33DX-$1239 66DX/2-$1394
40DX-$1259

READY TO GO

Don't just blindly look for the lowest price! It makes no sense to buy a VLB system without hard disk controller and video card on VLB. You aren't taking advantage of the VLB! Be careful, from time to time, you see ads selling cheap VLB without real controller and video card. Don't take the bait! Or you end up losing money to upgrade!

Wrong! You have only one choice, if you want it to be a smart choice! Building a PC is not merely putting parts together and booting to the C: prompt. To achieve cost effective, optimized performance, you need to know exactly how each component behaves and understand their characteristics and compatibility. At UMiracle, we keep searching and testing everyday. When you want the latest technology that works, at the best price, you have only one choice! Precise no-guessing price quotation, wide selection of the latest products, technical expertise, thorough hardware testing, on-time delivery. You can compare, but you will ultimately come to us. Guaranteed!

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* Systems marked with "READY-TO-GO" are ready to be picked up or delivered within 30 minutes - Please allow more time for minor configuration changes.

** Most components come with over 1 year manufacturer warranty - First year will be covered by UMiracle. Warranty after the first year will be covered by manufacturers.

*** All complete systems are assembled, jumpers and switches setup/configured, DOS and Windows V3.1 tested, high resolution video monitor mode tested and continously burned in for 48 hours on all components and finally interactively inspected for trouble-free operation.

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Components/Upgrades

Add and subtract to make your dream machine!

Motherboard without CPU: (Call for CPU Prices)

386-40DX with CPU 128K	$140
386/486 ISA 128K - 386/486 CPU support	$100
486 UMiracle Green ISA VLB 256K - 3 VLB P5 OD support, able to turn off HD, Monitor horizontal Sync, CPU Slow Down	$115
486 AIR-SH Green ISA VLB 256K - 3 VLB slots Upto 32MB, ZIF, P5 OD support, bus-master	$120
Optional Flash BIOS for AIR-SH	$35
486 AIR-UL ISA VLB 256K - 3 VLB slots, upto 50MHz Upto 64MB, ZIF, P5 OD support, bus-master	$160
Memory Expansion Card 32MB for AIR-UL	$90
486 AIR-MIS ISA VLB - Bus-master, w/ VLB IDE, FD, 2S/1P & VLB SCSI-2 w/ Adaptec 6360 chpset, Upto 64MB by 72Pin SIMM, ZIF, P5 OD support 256K	$305
Optional Flash BIOS for AIR-MIS	$35
486 AIR-EI Full EISA VLB - 3 VLB Slots, upto 50MHz, Upto 256MB by 72Pin SIMM, ZIF, P5 OD support, 8 EISA slots w/ 3 VLB extension(256/512K)	$340/420
486 Micronics ISA VLB JX-30 256K, VLB IDE, I/O	$450
486 ISA PCI 256K - 3 PCI, 5 ISA Slots, ZIF, P5 OD Support, Intel Saturn ChipSet, Upto 128MB by 72Pin SIMM, Bus-master, Dallas onboard Battery, Phoenix BIOS, onboard PCI NCR SCSI-2 Controller, Complete software driver for OS/2, NT, UNIX	$340
Pentium P5 PCI 256K - 4 PCI, 4 ISA Slots, ZIF, Onbrd NCR SCSI-2 Controller, Intel Mercury ChipSet, Upto 128MB by 72Pin SIMM, Bus-master, Dallas Battery, Phoenix BIOS, Complete driver for OS/2, NT, UNIX	$450
Micronics M5PI Pentium PCI Motherboard 256K, onboard PCI IDE, I/O, 72Pin SIMM Support, 3 PCI slots with CPU 60MHz	$1499

CPU & Memory:(Please Call, Subject to Change Daily!)

Pentium P5-60MHz/66MHz CPU	$Call
Intel 486-33SX/33DX/50DX2/50DX/66DX2	$Call
AMD 486-40DX/50DX2/66DX2	$Call
Cyrix 486-33DX/40DX	$Call
8Kx8/32Kx8/128Kx8 Cache Memory	$2/$5/$32
1MB DRAM (44256-70ns DRAMx8pcs)	$40
1MB VRAM (44256-70ns VRAMx8pcs)	$60
1MB RAM (256K-70ns SIMMx4pcs)	$48
4MB RAM (1M-70ns SIMMx4pcs)	$Call
16MB RAM (4M-70ns SIMMx4pcs)	$Call
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AT I/O 2S/1P/1G	$12
AT I/O 2S/1P/1G w/ 2 HiSpd UART 16550's	$39
4 Serial Port Card with Cable	$65
16Bit IDE 2FD/2HD Controller	$12
16Bit IDE 2FD/2HD with 2S/1P/1G	$14
16Bit IDE 4FD/2HD 2.88MB support	$29
16Bit IDE 4FD/2HD 2S/1P 2.88MB support	$49
IDE Caching Controller Upto 64MB, 2HD/4FD	$65
VLB IDE I/O Controller with 2HD/2FD 2S/1P/1G	$25
VLB IDE 2HD/4FD with I/O Support 2.88MB, with 2 HiSpd UART 16550's, 1 Parallel, 1 Game.	$69
Promise DC-4030VL-2 VLB IDE w/ 0MB Cache	$130
UltraStor 34F SCSI-2 VLB Bus-Mastering	$265
BusLogic BT445S VLB SCSI-2, Bus-Mastering w/ Floppy Ctrl & Driver Kit	$265
Adaptec 1522A SCSI FD Controller (Bare)	$80
Adaptec 1522 SCSI FD Controller w/ Kit	$135
Adaptec 1542 Bus-master SCSI FD (Bare)	$185
Adaptec 1542CF Bus-master SCSI FD w/ Kit	$240
Adaptec 2742T EISA RISC-based SCSI-2 Controller w/ Dual Channel supporting 14 HDs, 2.88M	$365
Adaptec 2842VL VLB-to-Fast SCSI-2 Controller w/ 2.88MB Support & Driver Kit	$295
AIR QAccess Fast SCSI-2 VLB Controller w/ Adaptec 6360 Chipset and EZ-SCSI Software w/ VLB IDE/FD and 2S/1P/1G	$135
External SCSI-2 Adapter for QAccess/MIS/Any Onbd internal SCSI	$30
Ethernet NE2000 Adapter Coaxial/10-Base T	$48

Video Card:

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Tseng-ET4000 VLB 1MB 16.7M Color	$100
Tseng-ET4000-W32 VLB 16.7M Color 1MB/2MB.	$125/185
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SPiDER Cirrus Logic 5426 VLB 1MB/2MB	$95/135
SPiDER Cirrus Logic 5428 VLB Plus 1MB/2MB	$120/160
SPiDER Black Widow VLB 1MB/2MB	$195/255
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KFC 14" 1024x768NIx0.28DP	$265
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Sony 1730 17" 1024x768 0.25DP	$990
Sony 17SE1 17" 1600x1200 0.25DP	$1230

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Zoltrix Standard Int. 96/24 9600 S/R Fax/2400 Data + Bitfax for Windows + MNP5 Software	$48
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Intel Fax Modem 14.4K Internal/External	$150/175

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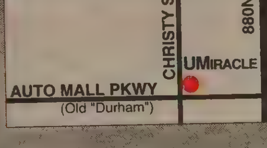

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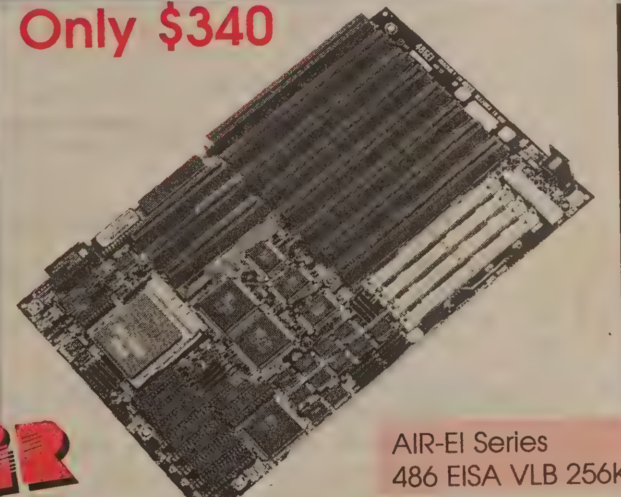

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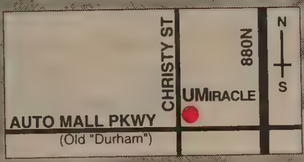

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telecommuter can probably attempt as part of a trial run.

The trial run gives the new telecommuter the opportunity to make appropriate arrangements at home—particularly with family and with small children, and to test them out in practice. These arrangements should cover:

- Sharing with family members the nature of the telecommuting commitment, the goals and deadlines of the trial run project, and the days that one will be working away from the office.
- Working out with family members exactly what criteria to use in deciding whether or not to interrupt the telecommuter's work at home at a particular moment. For example, can a child expect Mom or Dad to stop working just to drive them to a friend's house? To make lunch? To answer a homework question? To change a diaper? With small children, it may be difficult to have a discussion or explain the nuances of when it is—and is not—appropriate to interrupt. But if the telecommuter is clear about these matters, young children and even babies will get the message through the consistency of the new telecommuter's actions and decisions. Telecommuters are generally not able to work productively and also take care of children—so separate arrangements should be made.

Assuming the **work environment** is supportive of telecommuting, and the **individual** is personally a good candidate, the next important concern is that the work be suitable for **telecommuting.**

- Establishing rules about other family members using the telecommuter's workspace. Is the computer to be used for video games? Can someone take a pencil or tablet from the desk? Borrow the stapler? Suppose the regular home telephone line is busy and a teenager needs to make an urgent call? What if the business phone rings and the telecommuter is not around? Should someone answer? What should they say?

GOOD WORK HABITS

During the Trial Run, and afterwards of course, the telecommuter needs to know and utilize a set of work habits that have proven themselves to be most appropriate and effective in telecommuting situations. Briefly, these work habits include:

Good Pacing—It's important that the telecommuter maintain a steady rate of starting, moving forward on, and completing specific assignments and projects. Too slow, and productivity will drop. Too fast, and the telecommuter risks "burnout" or dissatisfaction that will prematurely end his or her career as a telecommuter. It's also important to take regular breaks throughout the day—perhaps one before starting work, one mid-morning, a lunch break, one mid-afternoon, and a post-workday break that serves as a psychological divider and refresher before the telecommuter launches into the responsibilities that generally appear at home around dinner-time and later.

Good Scheduling—Telecommuting successfully requires somewhat better planning skills than working successfully in the office. The telecommuter must arrange to have access to people and other resources at the specific times when he or she will need them for specific tasks and projects. By contrast, generally these people and resources are available almost any time to workers operating in the office.

Good Organization—In addition to scheduling, it's important for telecommuters to keep track of resources—phone numbers, paperwork, computerized files, and so forth—so the resources they need each day can be brought to the location where they're working. It' also important for telecommuters to have a particularly clear sense of what they are trying to accomplish, so they can focus steadily on a few important objectives and produce meaningful results supporters and skeptics alike can readily appreciate.

Good Self-Discipline—The temptations not to work are far greater for the telecommuter than for the office-bound worker. It takes a commitment to self-discipline to avoid such bad habits as: sleeping late, spending the day in your pajamas or nightgown, staying in bed or on the couch to work, letting the TV or radio distract you or absorb too much of your work time, taking too-frequent snack or meal breaks, and running errands or relaxing when you should be working.

Good Communication—Even though the telecommuter generally works separate and alone, he or she should make a strong effort to remain part of the team at the office. This means avoiding the temptation to switch tasks or re-structure projects without telling anyone else, particularly when other people are counting on you to do things a certain way or complete a certain task by a pre-arranged deadline. The successful telecommuter spends a lot of time and effort processing the day's events with team members—reviewing ideas and activities, considering plans and future options, consulting before making decisions, and reviewing past actions to judge their impact and success.

Good Flexibility—Despite the need for planning, telecommuters must also maintain a degree of flexibility—enough to change telecommuting days to accommodate an important meeting that will occur in the office, or to give up a week or two of telecommuting to meet special demands for office-time, or even to work extra hours as a telecommuter to meet a suddenly accelerated deadline for results.

TAC'S TELECOMMUTING 2001

May 5-6, 1994, are the dates for the Telecommuting Advisory Council's first national (in-person) conference, entitled: Telecommuting 2001. It's slated to be held at the luxurious Pointe Hill Resort on South Mountain, in Phoenix, AZ. To receive a registration brochure, call 602-759-7883, or write the TAC National Conference, 3239 E. Cottonwood, Phoenix, AZ 85044.

TELECOMMUTE '94 CONFERENCE

October, 1994, is the season for Telecommute '94, a high-level conference sponsored annually by Gil Gordon. In future articles I'll provide more information on scheduled speakers and the topics to be covered. Those interested in receiving word immediately can obtain an announcement and registration package by calling (908)329-2266 (or faxing: (908)329-2703). ■

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OS/2:

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16550. Now, a 16550 with a bigger buffer is another matter... [The OS/2 communication] drivers [were] written for the 16550 [and] will generate a lower interrupt load [with it] than [with the Smart UART's] 16450, and that adds up to a lot of cycles."

With a 16450 UART an ISR is issued for each character of data. At high speeds this means many frequent ISRs, which will tax the CPU and all running applications will suffer. But a 16550 UART is programmable by software to issue an ISR for every 1 up to 14 characters in the FIFO buffer, which means less, rarer ISRs and, thus, a lower burden on the CPU, which can pay better attention to all applications. The performance improvement depends on the multitasking load, and may not be noticeable if the CPU is idle, but it is precisely if and when you need to multitask heavily that you want the faxmodem to give you its best.

IT'S THE SUPPORT, STUPID!

As I already argued in previous articles, everything boils down to proper OS/2 support by hardware and software vendors. OS/2 provides superior capabilities, but if vendors do not exploit them, the benefits will not materialize for the user.

Intel officially supports the SatisFAXtion product line only for DOS and Windows. OS/2 fax support comes from other vendors (PMFax—better known as FaxWorks for OS/2—comes with direct support of the coprocessing capability), and the modem component just happens to work under OS/2 (although users who experience problems must resort to trial and error or the help of other users to resolve them). But the 16450 emulation of the Smart UART is not the best for heavy OS/2 multitasking.

Yelverton again: "The *internal* buffer of the Smart UART and the 16550's FIFO are *not* at all equivalent. The 16550 implements access to the FIFO via the programming and hardware interface, there is *no* such access provided to the Smart buffer, which is completely hidden from the system and any application. There just isn't any way a driver could be written to make multibyte reads or writes to take full advantage of the internal buffer since the 16450 emulation doesn't even recognize the concept of multibyte in/out and only processes a *single* byte for each ISR."

Intel recently released a new version of the 400i which provides 16550 emulation. The OS/2 communication drivers can activate the FIFO buffer and the multibyte ISRs, and thus lessen the CPU load, enhancing performance during heavy multitasking. One user who did some simple tests reported 20% lower CPU loads than with the older 400i. Even when running just a communication program, I was myself able to discern a very slight lessening of the load.

The major advantage of the SatisFAXtion is the fax coprocessor. With the added 16550 support, now there is an additional advantage of the SatisFAXtion/400i for OS/2: you also get improved modem performance. If only Intel supported OS/2 officially there would be hardly a reason for OS/2 users not to prefer it.

(I would like to thank Ward Yelverton, Shmuel Metz, and other users on CompuServe who helped with some of the intricate and rather confusing technical details.) ■

(From the file SFXURT.TXT, available on the Intel BBS and the INTELFORUM on CompuServe)

What is data overrun anyway?

A communication application typically uses a routine called by serial port hardware interrupts to collect received data in a buffer for when it gets busy doing other things which take a long time—for example writing received data to disk. As this buffer gets close to filling, flow control is used to tell the modem to stop sending data to the PC serial port.

Flow control prevents the PC communication application character buffer from spilling over and losing good data because it is known in advance that the buffer is getting full. The local modem being held with flow control stalls the remote modem off by sending special V.42 or MNP messages that tell it to wait for a while.

But now we are using PCs with virtualized multitasking environments like Windows that can distract the PC's processor for extended periods with no prior warning to the communication application. If the modem is not being held off with flow control and the PC's processor gets distracted for more than one character time (or up to 16 characters for a 16550A FIFO UART), data get lost at the PC's serial port UART.

Although flow control does a good job of preventing the communication application's buffer from overflowing and losing data, it cannot provide the same service for the UART's tiny buffer. If characters are lost like this during a file transfer (Zmodem, etc.), that damaged block must be sent again as if bad data were coming out of a modem that had no error control. If it happens while scrolling your email, the lost characters will be missing from the text you are reading (e.g., $1000 may appear as $100).

Confused? Consider this silly analogy. Let's say that you have a 10-gallon bucket of water that you want to get filled to wash the car, but some creep stole your garden hose, and the faucet is located right over an extremely fragile plant with shallow roots. Cleverly, you run into the house and get two coffee cups. As one cup is filling from the faucet, you are emptying the other into the bucket that is a foot or two away. All you have to do to prevent spilling water is to get that freshly emptied cup underneath the filling cup before it spills over—no sweat! At about the 2-gallon mark, a bee lands on your nose, and you're suddenly not so concerned about how quickly you get that empty cup back under the faucet. Eventually, the bee decides you're a pretty raunchy smelling flower, and buzzes off. You then look over just in time to see your shallow-rooted plant floating down the gutter drain!!

So then, think of the receiving modem as the faucet, the PC's UART as the two cups, and you are the PC's processor—get it?

What the Smart UART does for you

Both the SatisFAXtion 200 and 400 faxmodems have a large gate array device which, in addition to other functions, provides special circuitry that appears to the PC processor as a standard 16450-compatible serial port. In reality, it's just a facade that looks just like a serial port. Instead of shifting the character bytes serially in from and out to a modem on the far end of an RS-232 cable, the characters stay intact as bytes. These characters are transferred directly between the PC processor and the SatisFAXtion 80C186-16 on-board processor through the silicon. The special circuitry inside the device gives the coprocessor complete visibility and control of the 16450 facade internal workings. The coprocessor knows what the PC processor is doing on the other side of this facade, and more importantly, has direct control over what the PC processor sees.

On SatisFAXtion 200 and 400, since the coprocessor knows whether or not the PC processor has taken the last character that it deposited into the 16450 interface, it will *never* try to put another character in until the previous one is read—no data are spilled. Think of it as a really smart faucet that shuts off the water if you don't replace the cup in time. This is true no matter how fast the data are being moved or how busy the PC processor is. The on-board 80C186-16 will wait indefinitely until the PC processor has taken the last character before trying to give it a new one. This protection against data loss enables you to set your communication application baud rate (DTE rate) higher with less fear of losing data.

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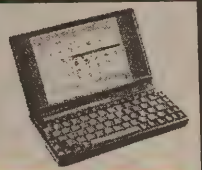

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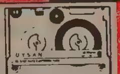

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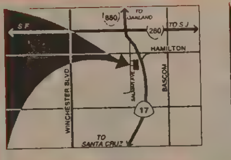
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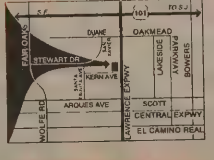
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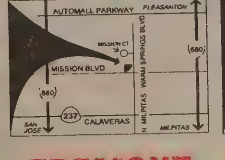
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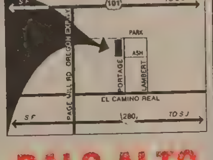
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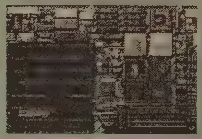

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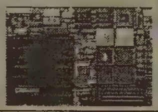

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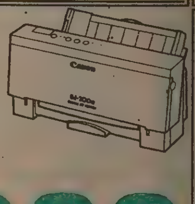

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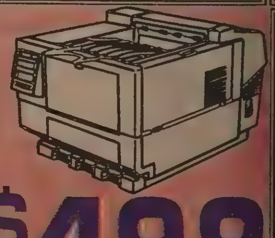

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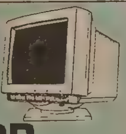

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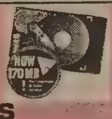

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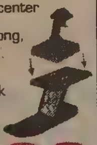

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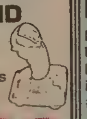

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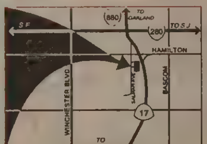

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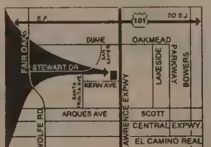

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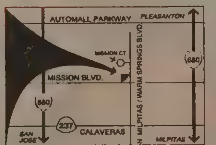

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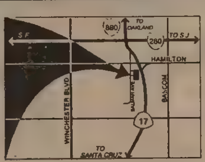

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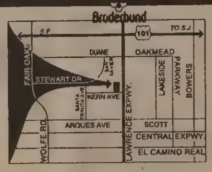

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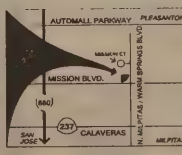

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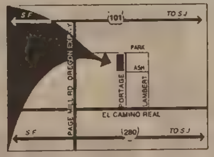

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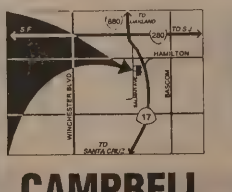

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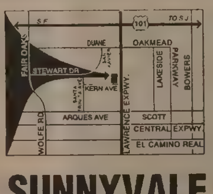

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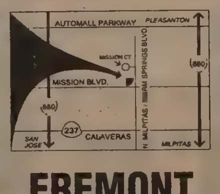

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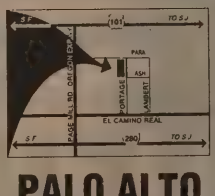

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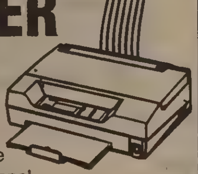

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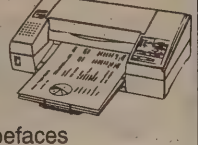

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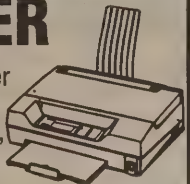

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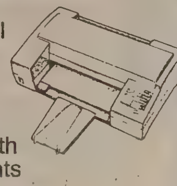

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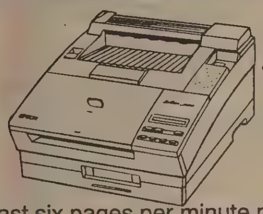

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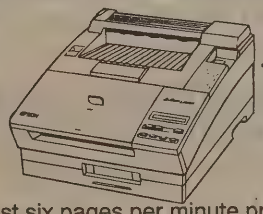

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- 1MB memory expandable to 5MB on motherboard

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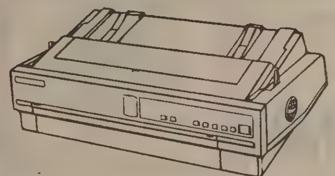

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- 252 CPS Draft Mode
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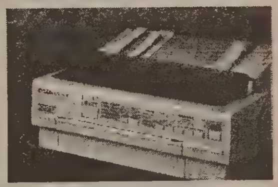

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- 360 dpi with Optional Film Ribbon

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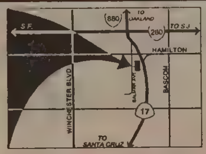
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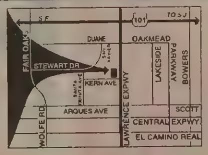
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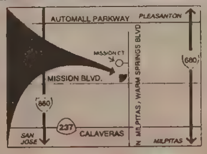
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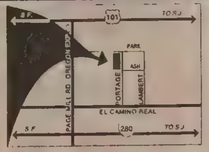
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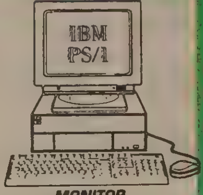

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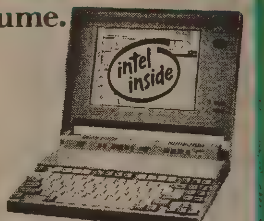

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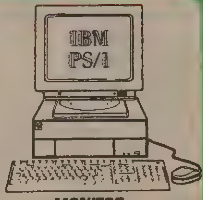

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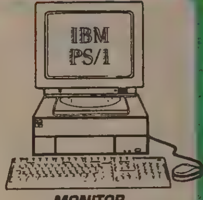

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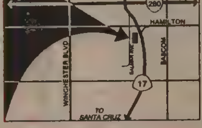
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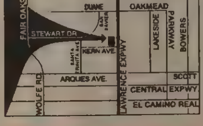
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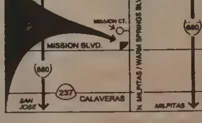
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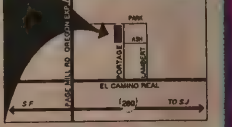
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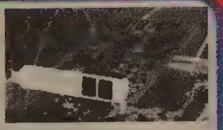

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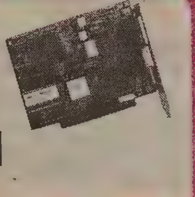

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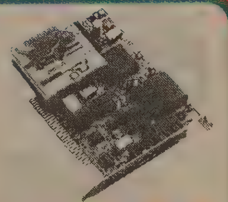

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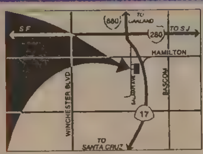
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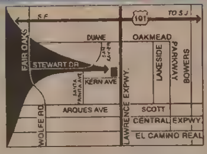
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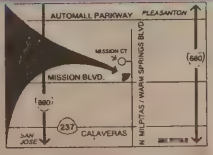
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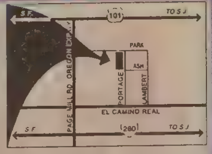
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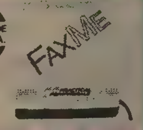

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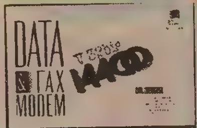

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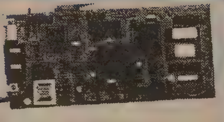

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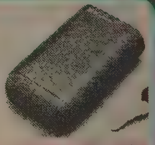

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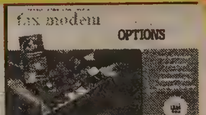

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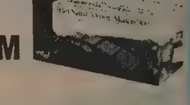

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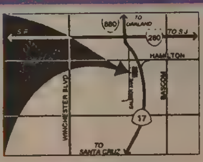

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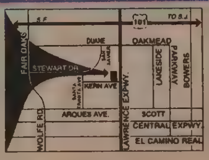

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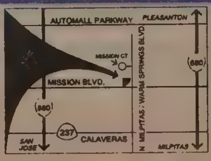

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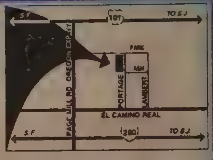

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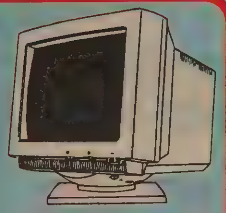

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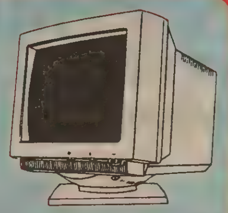

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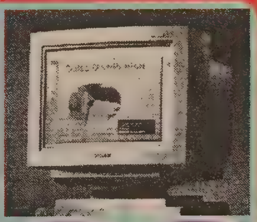

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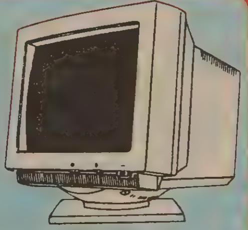

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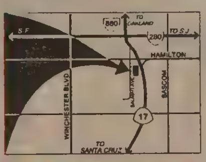
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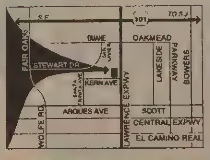
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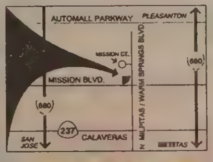
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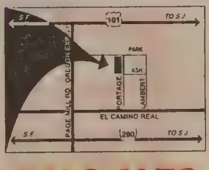
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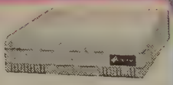

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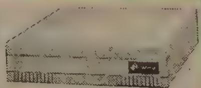

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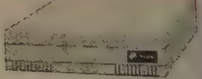

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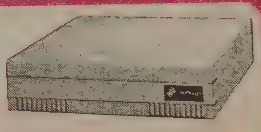

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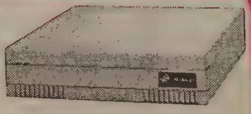

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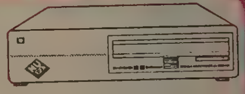

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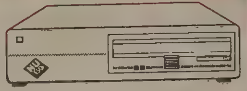

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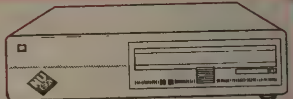

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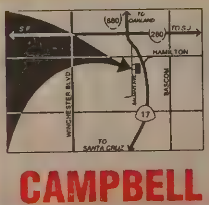
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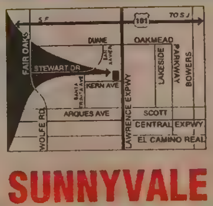
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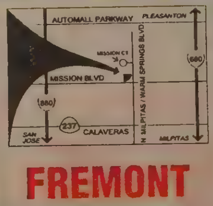
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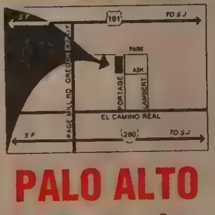
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16.5 msec Access • IDE Hard Drive • 3.5" X 1" Height
One Year Warranty
#1886182

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255MB 3.5" IDE HARD DRIVE

12ms Average Access • 1" HT. • 3.5" Form Factor
CP30254 #1795356

$229

Seagate

260MB IDE HARD DRIVE

1"HT • 16MS Access • 64K Cache • Bulk Pack • ST-3290A #1836213

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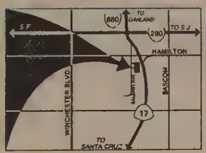
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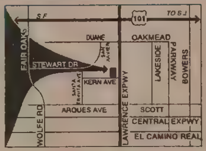
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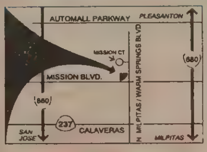
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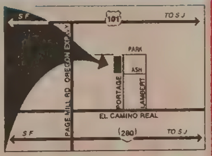
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HARD DRIVES

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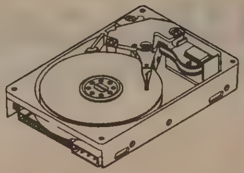
340MB 3.5" IDE HARD DRIVE

13msec Access • 3.5"
CP30344 #1825736



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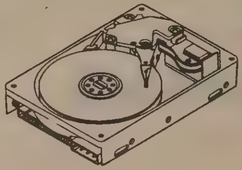
340MB IDE HARD DRIVE

1" HT. • 15ms Access Time • 345MB Formatted Capacity
7345A #1781762



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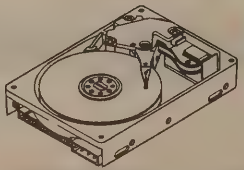
Seagate

340MB IDE HARD DRIVE

1"HT • 12MS Access • 256K Cache • Bulk Pack
ST-3390A #1836246



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CONNER

420MB 3.5" IDE HARD DRIVE

$359

14ms Fast Access • 3.5" X 1" • 32K Buffer IDE Interface #1886218

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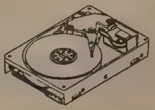
540MB 3.5" IDE HARD DRIVE



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3.5" X 1" HT • 8.5MS Access Time
540A #1802162

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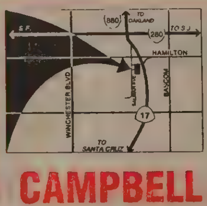
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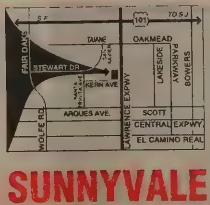
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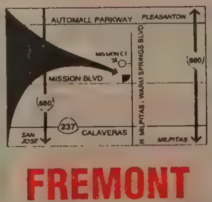
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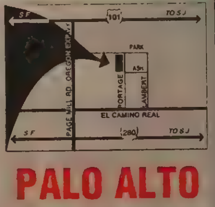
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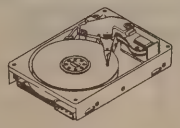
SCSI HARD DRIVES

Maxtor

345MB SCSI HARD DRIVE

3.5" X 1"HT. • 14msec Access
7345S #1807673



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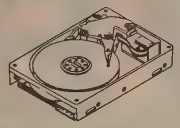
Maxtor

540MB SCSI HARD DRIVE

3.5" X 1"HT. • 8.5msec Access
540S #1802173



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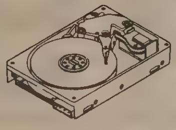
1 GIGABYTE SCSI HARD DRIVE

1" Size • 9MSEC Fast Access • 256K Cache • Smallest 1 Gigabyte
#1844890

$899

Quantum™ 1.05 GIGABYTE SCSI HARD DRIVE

1.05 GB SCSI, 10MSEC, 1" HT, 5 Years Warranty
#1899052



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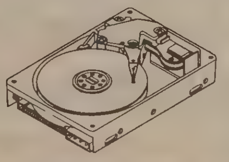
Quantum™



1.8 GIGABYTE SCSI 3.5" HARD DRIVE

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1/2 ht. • 10msec Access Time
512K Cache • Five Year Warranty
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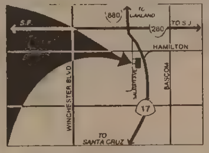

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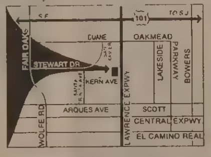

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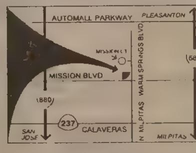

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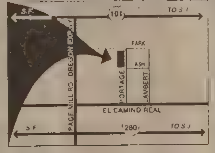

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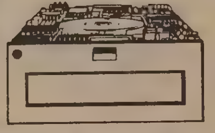
BACK-UP DRIVES



120MB TAPE BACKUP

- Average Capacity of 120MB with data compression
- Plugs into floppy controller
- Built-in error correction code
- 90 days warranty

Excel 60F #1871531

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250MB TAPE BACK-UP

250MB Internal Tape Backup
Runs off of Floppy Controller
Central Point Software For Windows & DOS • 2 Year Warranty
Model SE250 #1635586

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IBM

250MB EXTERNAL TAPE BACK-UP

Data and Power Cables • Includes Software and Tape
TD632 #1780185

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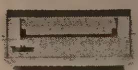

Jumbo Trakker 120MB Parallel Printer Port Tape Backup System

Plug and Play. No hardware installation. Trakker connects to your computer's parallel printer port.
Full Compatibility. Works with any computer with an IBM* compatible parallel printer port.
Dual Connectors on Back Panel. Trakker and printer share a parallel printer port.
Trakker Portability. Easily shuttles between laptops and desktops.
QIC-40. Industry Standard Recording Format for data interchange.
JT-10 #1740792

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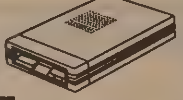

128MB EXTERNAL MAGNETO OPTICAL

Includes cartridge, installation kit and manual #1842496

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5 GIGABYTE DATA TAPE BACK-UP

4MM SCSI • 783KB Per Second • About 47MB Per Minute #1842153

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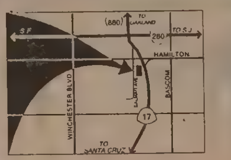
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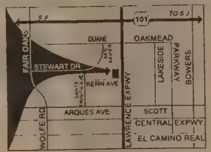
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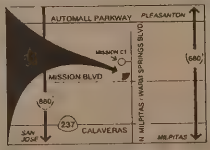
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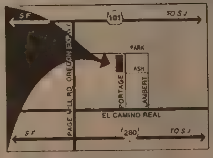
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- 300 KB/sec data transfer rate • 64KB RAM buffer
- Multi-session photo CD compatible
- 320ms access rate • 680MB data capacity
- Daisy-chain up to four Creative Labs drives
- CD-ROM XA ready

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TOSHIBA DUAL SPEED INTERNAL CD-ROM

SCSI CD-ROM • 200ms Access
256K Cache
330KB/sec Transfer Rate

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XM3401B
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OMNI CD EXTERNAL MULTIMEDIA UPGRADE KIT

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- 300 KB/ sec Transfer Rate

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450KB/sec Transfer Rate • 195ms Access Time
256K Cache • Photo CD Compatible
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CDR-600
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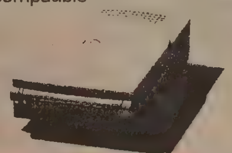

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MultiSpin CD-ROM READER
NEC

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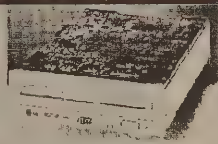

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Internal CD-ROM drive, Double Speed,
320ms access time,
300K Bytes data transfer rate.
Multi-session Photo CD ready.
Includes mounting hardware,
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software
titles.

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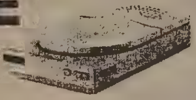
MULTISPIN 3XP PORTABLE CD-ROM



Portable Gray CD-ROM
450KB/sec Transfer Rate
MID 200ms Access Time
256K Cache
PHOTO CD Compatible
#1839157

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NEC

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CD-ROM DRIVE

CD-ROM Drive
CDS-3110

- Kodak Multi-session Photo CD Compatible
- Double Speed - 300kbs / 350 ms - MPC Level II
- Supports CD-XA, CD-DA, CD-I Formats
- Motorized Tray Loading and Front Panel Controls
- Interface Card and Cable Included
- 64k Buffer

CDS-3110 #1849611

ORCHID

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EXTERNAL CD-ROM

NO INTERFACE REQUIRED

External Portable CD-ROM Connects To Parallel Port
150KB Transfer Rate

$365

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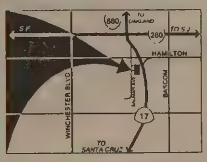
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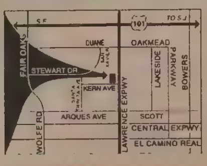
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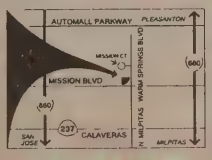
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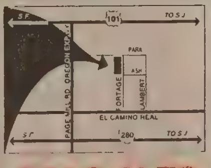
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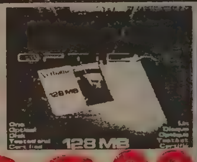

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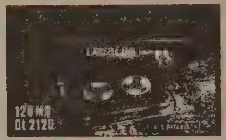

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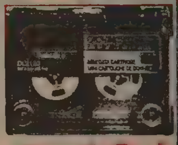

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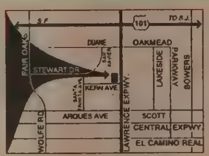

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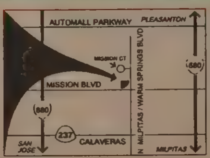

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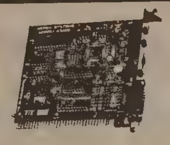

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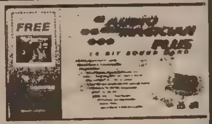

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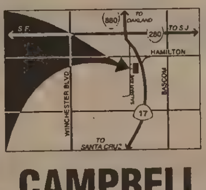

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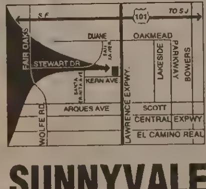

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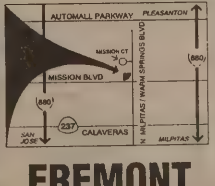

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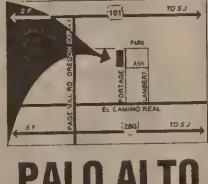

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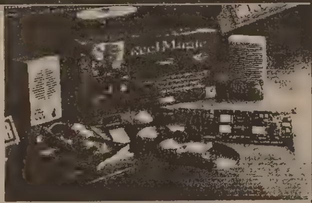

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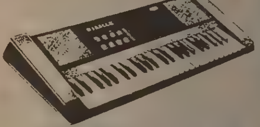

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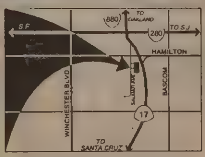
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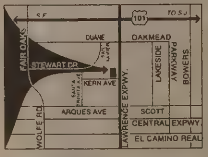
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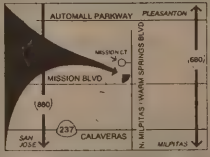
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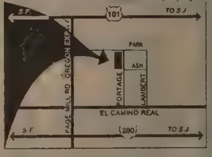
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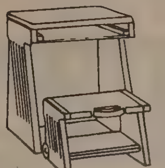

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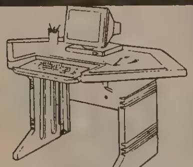

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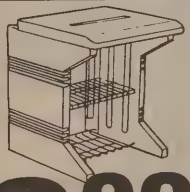

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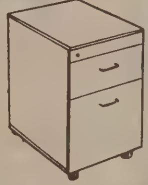

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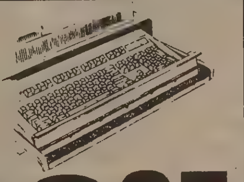

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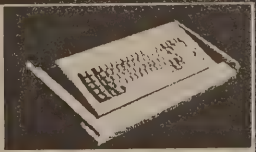

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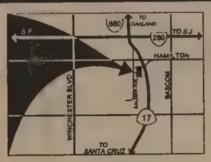
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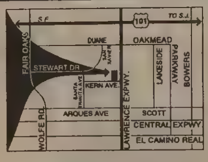
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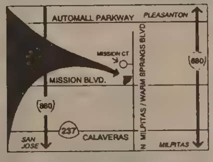
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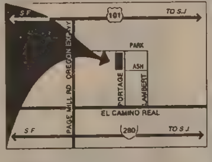
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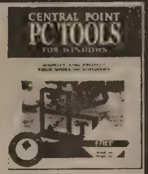

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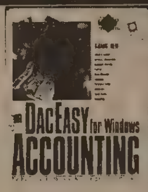

With DacEasy Accounting for Windows, writing checks, creating invoices and other typical accounting functions have reached new levels of simplicity. Its paper-look-a-like screens are familiar and straight forward, making it remarkably easy to use. Accounting just doesn't get easier than this.

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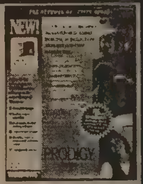
PRODIGY FOR WINDOWS



PRODIGY is the online service millions rely on to connect them to more people, more information and more entertainment. Enjoy all the advantages the PRODIGY service offers plus the convenience of Windows.

PRODIGY Interactive Personal Service

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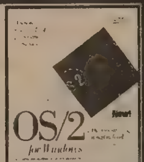
OS/2 2.1 FOR WINDOWS



Take Windows to a higher level

OS/2 for Windows brings a new level of power and performance to your PC. OS/2 for Windows can exploit your hardware in ways it simply couldn't before. It enhances it. Your Windows desktop can look and work the same. Or you can start to explore the object orientred world of the OS/2 workspace Shell and discover how easy and fun true "drag and drop" computing can be. The choice is yours!

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Traveling Software

LAPLINK V

LapLink V carries on the tradition of excellence found in every one of Traveling Software's products. This new release is truly the "next generation in file transfer software." With LapLink V you'll get more of everything you need to work smarter and faster.

$109.95

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Microsoft Windows 3.11 for Workgroups Add-On

Operating System Upgrade for any PC Running Windows 3.1

Speed up the Microsoft Windows operating system 3.1 with this upgrade, whether your computer is networked or stand alone. With it, you can use a fax modem to send and receive faxes directly to your PC and with a network card, you can exchange files and share printers with other PCs in your workgroup. Any way you look at it, you get the fastest, best version of Windows for your PC.

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MYST PC CD-ROM

Myst is an adventure game unlike any other, with stunning 3-D photo realistic worlds. Myst is a surrealistic exploration, where every vibrant rock, scrap of paper and sound may hold vital clues to your unraveling a chilling tale of intrigue and deceit.

Mouse, hard disk and a CD-ROM drive required

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CRITICAL PATH

Critical Path is a new level of CD-ROM realism and excitement, 3D Motion video, explosive sound effects and music soundtrack. It's a gritty, realistic cinematic experience.

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STAR TREK 25TH ANNIVERSARY ENHANCED CD-ROM

Piloting the U.S.S. Enterprise™ is a thrill in itself. But now the actual voices of William Shatner, Leonard Nimoy, Deforest Kelly, James Doohan, George Takei and Walter Koenig will make your adventure truly out of this world. As Captain Kirk, you'll control phasers, photon torpedoes, shields and communications. Plus you'll test your intergalactic problem solving savvy during eight separate space and ground missions in stunning 3D alien worlds.

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Interplay

Fatty Bear's Birthday Surprise

Fatty Bear's Birthday Surprise is an adventure game designed especially for children. Children enhance problem-solving skills while happily exploring Fatty Bear's world; the goals even vary in response to your child's actions.

ELECTRONIC ARTS

$32.95

IBM
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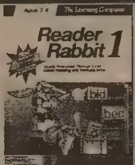
The Learning Company

Reader Rabbit 1



In this time-tested classic, Reader Rabbit transforms pre-readers into early readers before your very eyes. Feel their excitement as they read and spell on their own!

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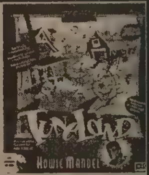
7th LEVEL™ TUNELAND



Starring Howie Mandel

Join Howie Manel as "Lil' Howie," your friendly comic host in this musical wonderland from Tuneland.™ Packed with more than 40 fully-orchestrated songs and astounding feature film quality animation, you can play Hide n' Seek with Lil' Howie while he tells you jokes and performs hilarious comedy gags.

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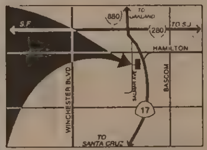

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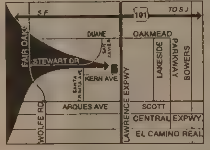

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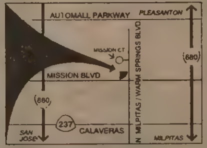

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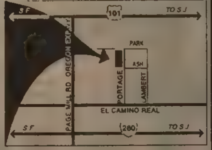

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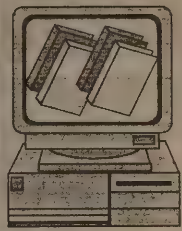

COMPUTER BOOKS

MULTIMEDIA

MULTIMEDIA MAKING IT WORK

Whether you have a casual observer's interest in multimedia,or are a multimedia professional seeking the insider's track on the latest products and innovations, **Multimedia: Making It Work** helps you unscramble the variables and put the impact and power of multimedia to work for you.

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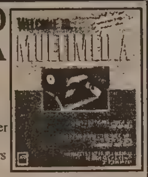
WELCOME TO MULTIMEDIA WITH CD-ROM



This easy-to-understandbook introduces you to the exciting new world of multimedia. You'll discover what multimedia is and how it is revolutionizing the use of computers in education, training, marketing, and entertainment.

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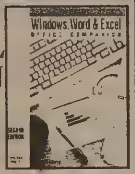
WINDOWS, WORD & EXCEL OFFICE COMPANION SECOND EDITION



Why spend three times the money on three different books to collect three times more information than you need? **Windows, Word & Excel Office Companion,** in its updated 2nd Edition, provides help in a hurry for newcomers to Microsoft's industry -leading business software.

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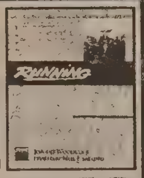
RUNNING MICROSOFT WORKS 3 FOR WINDOWS



You'll quickly learn how to produce professional-looking documents with the word processor, create financial spreadsheets complete with graphs and charts, & develop efficient databases that display information in avariety of useful ways.

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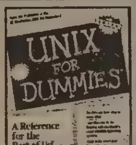
Word Perfect Office Complete Reference #1725816 $\$25^{95}$

OPERATING SYSTEMS

UNIX FOR DUMMIES



UNIX may be technical and non-intuitive, but you don'thave to be a tech-head to use it effectively.

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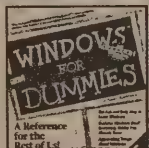
WINDOWS FOR DUMMIES



You thought Windows was supposed to be easy, didn't you? Now it can be with Windows For Dummies, a lighthearted yet informative guide to using Microsoft Windows.

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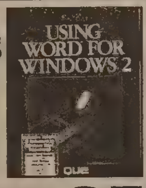

Improve your word processing performance with macros and customization strategies. Discover great page layout, typography, and design techniques. This book reveals all the power-packed secrets.

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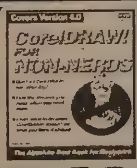
One Minute Word For Windows #1793181 .... $\$5^{95}$

GRAPHICS

COREL DRAW FOR NON-NERDS



Emphasizes the practical, business uses of CorelDRAW! for non-expert users, even PC **novices!** You'll also learn about Photo-Paint, Trace, Chart, Show, Move.

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Harvard Graphics For Windows Quick Reference Guide #1698473 $\$6^{49}$

Shareware Treasure Chest, Clip Art #1766543..... $\$12^{95}$

AutoCAD Professional Reference 2nd Edition, Rel 12 #1850763 $\$35^{95}$

Using Aldus Freehand 3.0 Professional #1730180 $\$21^{95}$

UTILITIES

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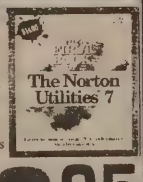
THE NORTON UTILITIES 7



With The Norton Utilities, you can improve your DOS efficiency! Learn the ins and outs of this powerful progran the easy way- with The First Book of The Norton Utilities 7, Whether you'e learning about utilities for the first time or are an experienced user new to The Norton Utilities.

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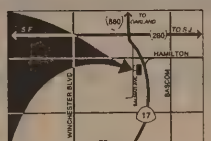

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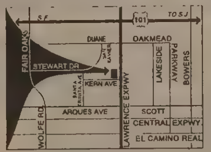

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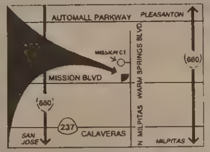

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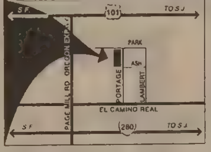

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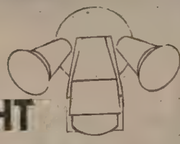

DUAL FLOODLIGHT MOTION DETECTOR WITH REMOTE LIGHT CONTROL

$\$59^{99}$

PR511
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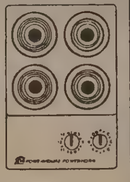

POWER HORN SIREN

Remote wireless 110 dB siren receives signals over house wiring and trips when Base Receiver's alarm is tripped.

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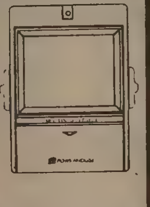

MOTION DETECTOR

Supervised Wireless Motion Detectors send signals to trip the Base Receiver's alarm when someone walks within range.

$\$59^{95}$

SP544
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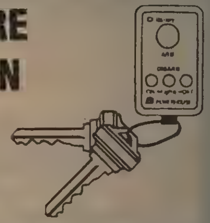

MINIATURE KEY CHAIN REMOTE CONTROL

$\$24^{99}$

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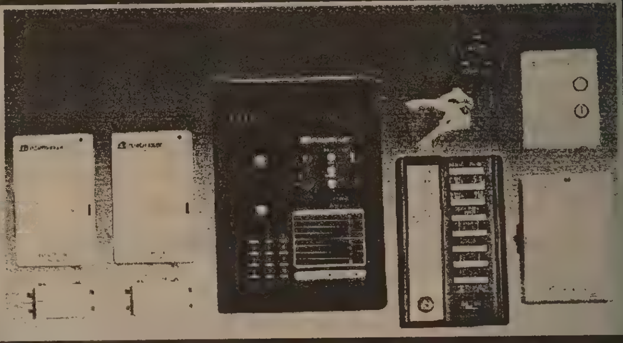
7 PIECE HOME SECURITY SYSTEM WITH VOICE DIALER



Protects your home and calls for help if there's a break-in.
Calls a friend or neighbor so there's no monthly monitoring fee! Installs in minutes.
No Tools! No Wiring!

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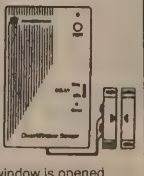

DOOR AND WINDOW SENSOR

Sensors send wireless signals to the Base Receiver when a door or window is opened. You can protect up to 16 doors or windows by adding more sensors. Sensors are supervised for professional reliability, they report in to the Base Receiver every 90 minutes

$\$18^{99}$

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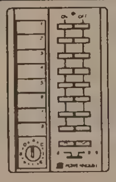

WIRELESS SECURITY TRANSMITTER

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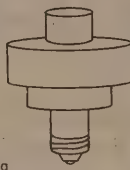

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Dimmer Module Screws Into Existing Light Socket, Existing Bulb Screws Into Dimmer Module.

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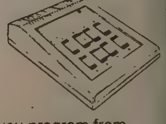

COMPUTER INTERFACE

Programmable Timer which you program from your computer and then disconnect - It does not tie up your computer! It Lets you program up to 256 modules to go on and off at specific times and dims lights too!

$\$64^{95}$

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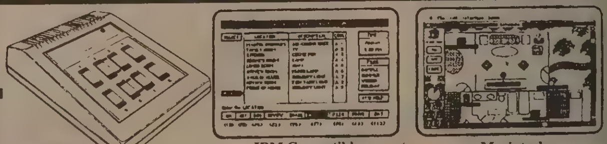

IBM Compatibles

Macintosh

Automate your home for the ultimate in comfort and security.

Make your home look lived-in by timing lights to turn on and off at preset times (never come home to dark house again). Wake up to stereo music and fresh brewed coffee. Turn on window air conditioners, sprinklers, drapery controls and more! 6 Piece Kit Includes: Home Automation Interface, Software, Connecting Cable, Lamp Module, Appliance Module and Universal Module.

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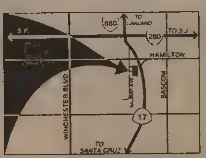

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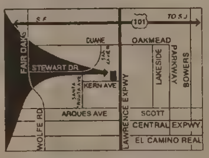

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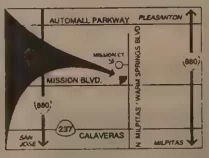

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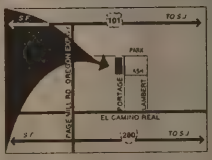

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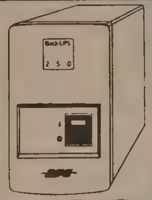

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250 Volt/AMP Backup Power Supply
2 Outlet • EMI/RFI Filtering
10 Minutes Back-Up at 250VA
#1651164

$109.99

IBM

UNINTERRUPTABLE BACK-UP POWER SUPPLY

- 250 VA • UL Listed
- Replaceable 3-5 year Battery
- EMI/RFI Noise Filtration
- Audible Alarm • One Touch Power
- 2 Outlets • Surge Supression

IBM P600 #1779262

$99.99

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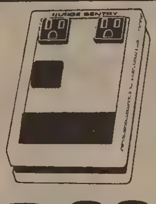
UPS250 UL 1778



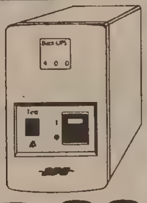
UPS250 UL 1778 250 Volt/AMP UPS.
Uses Replaceable Batteries.
2 UPS/4 Surge
#1840933

$129.99

APC
AMERICAN POWER CONVERSION

The Back-UPS® 400

from American Power Conversion



400 VA Backup Power Supply
Built-in Surge Protection
EMI/RFI Noise Filtering
10 Minutes of Power at 400VA usage
DB9 Interface Port
#1651175

$229.99

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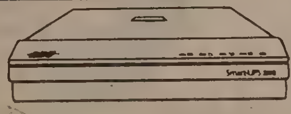
The Smart-UPS® 400VA

from American Power Conversion



Slimline design with 4 Outlets
Transformer Boosts power during brownout.

#1689242

$399.99

TRIPP LITE 400 VOLT BATTERY BACK-UP SYSTEM

2 Outlet power supply 360 Joules
RFI/EMI line noise filtering
UL listed, CSA approved
2 year product warranty
BC400
#1851096

$169.99

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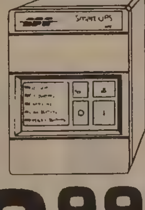
The Smart-UPS® 600

from American Power Conversion

Line interactive design



Better than standby or online unit.
Power output filtered through UPS Inverter
Boosts power during brownouts
Site and unit diagnostics
Network grade line conditioning
Batteries replacement warning
#1689264

$499.99

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The Back-UPS® 600

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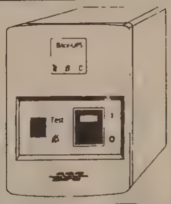

600 VA Backup Power Supply • Self Test Switch
Alarm Test Switch • Built-in Surge Protector
Power Supply • 4 Outlet
EMI/RFI Filtering
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$349

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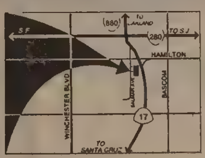
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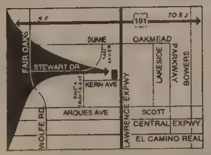
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STEWART DR
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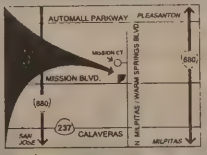
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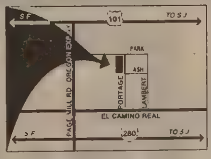
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MOTOROLA

CELLULAR TRAVELER PHONE

Motorola's traveler phone combines a compact design with a full 3 watts of power at the incredibly low price of only...

$139.95*

*After $25 Instant Service Activation Rebate. Price w/o Activation $164.95

Model 19031WASBA #1880979

MOTOROLA

TRANSPORTABLE HANDHELD CELLULAR TELEPHONE

Motorola's popular Hand Held Phone has all the right features! This compact unit will allow you to talk for up to 90 minutes, keep 30 numbers in memory, and much more!

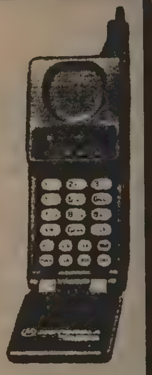
$174.95*

*After $25 Instant Service Activation Rebate. Price w/o Activation $199.95

Model 8000-HX #1502549

MOTOROLA

CELLULAR FLIP PHONE



This premium value cellular phone from Motorola comes equipped with 30 number memory, LED display, call timer, signal strength meter, a battery with 75 minute total talk time, and an overnight charger for only...

$239.95*

*After $25 Instant Service Activation Rebate. Price w/o Activation $264.95

Model DPC-550 #1635999

MOTOROLA

ALPHA MICRO-TAC CELLULAR PHONE

If it's small and lightweight you're looking for, this is the cellular phone for you! With its 101 alpha numeric memory, a desktop charger, and standard battery, this technologicaly advanced cellular phone can be yours for only...

$358.95*

Model DPCAC #1635988

*After $25 Instant Service Activation Rebate. Price w/o Activation $383.95

MOTOROLA

MICRO TAC LITE CELLULAR PHONE

Weighing in at 7.7 ounces and measuring 11.6 cubic inches, this is one of the lightest and most advanced cellular telephones available. With 100 alpha numeric memory, retractable antenna, standard battery, and desktop charger, you can receive state of the art performance and design for only...

$464.95*

Model MICRO TAC LITE BASE #1750739

*After $25 Instant Service Activation Rebate. Price w/o Activation $489.95

MOTOROLA

MICRO TAC ULTRA LITE CELLULAR PHONE WITH VIBRA CALL

Motorola's lightweight champion of cellular phones tips the scales at only 5.9 ounces and contains a unique ring selector that includes a setting for vibrate, just like a pager! Other features include 101 alphanumeric memory, memory scroll, recall, two batteries, rapid charger, carry case, and more for only ....

$699.99*

Model Micro Tac Ultra Lite #1794986

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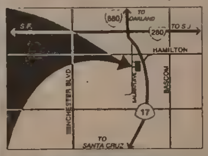
Service Activation Not Required. No Sales To Dealers Or Resellers. Limit One Per Family.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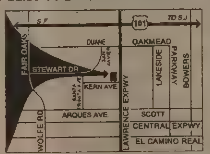
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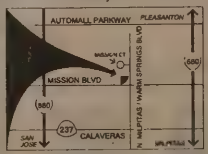
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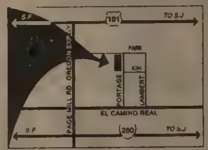
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ANSWERING MACHINES

Panasonic

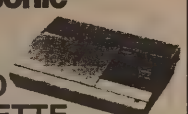
ANSWERING MACHINE

Answering system with Auto-Logic Operation, Tone Remote Control, Digital Display, Message Memo Recording and Remote turn on, Auto-Logic Operation Automatically Rewinds, Plays Messages, Stops at the Last Message and Resets itself at the Touch of One Button.

$\$39^{99}$

Model
KX-T1000
#1498194

Panasonic



DUAL MICRO CASSETTE ANSWERING SYSTEM

Panasonic's new dual micro cassette answering system offers an LCD Call Counter, marker message, room monitor, auto disconnect, electronic auto disconnect, electronic volume control, audible message alert, and much more for only...

$\$69^{95}$

MODEL
KX-T2100
#1740208

Panasonic

ALL DIGITAL 4 MAILBOX ANSWERING SYSTEM W/SPEAKERPHONE & VOICE TIME/DAY STAMP

Panasonic's fully featured answering system comes equipped with 30 minute storage capacity, voice time/day stamp, speakerphone, voice menu, 4 personal mailboxes with security, lcd display, message scan, programmable alarm, message transfer, 2-way record, selective message delete, message skip/repeat, auto disconnect, auto-redial, 10 number memory, and much more! An invaluable addition to any home or office at just...

$\$199^{95}$

MODEL
KX-T2880
#1841989

MULTI-LINE BUSINESS PHONES

Panasonic

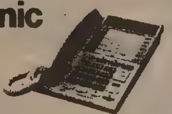
TWO LINE PHONE

A two line phone doesn't have to cost a fortune. Panasonic has the low cost answer for you. This unit has a convenient auto dialer, conference calling and much more!

$\$69^{95}$

MODEL
KX-T3110
#1505313

Panasonic



2-LINE SPEAKERPHONE W/ LCD DISPLAY

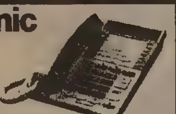
From Panasonic comes this fully featured 2-line speakerphone with LCD display, 3-way conference call, volume control for speaker and handset, 24-station one-touch dialer, auto redial, flash, separate ringer tone, line status indicator, memo dial, and save redial, all for only...

$\$89^{95}$

AVAILABLE IN BLACK OR WHITE

MODEL
KX-T3175
#1745122

Panasonic



3-LINE SPEAKERPHONE WITH LCD DISPLAY

From Panasonic comes this fully featured 3-line speakerphone with LCD display, 3-way conference call, volume control for speaker and handset, 48-station one-touch dialer, auto redial, flash, separate ringer tone, line status indicator, memo dial, and save redial, all for only...

$\$169^{99}$

AVAILABLE IN BLACK OR WHITE

MODEL
KX-T3185
#1768039

10 CHANNEL CORDLESS PHONES

Panasonic

10 CHANNEL AUTOSCAN CORDLESS PHONE

Panasonic's newest cordless phone comes equipped with a retractable flexible rubber antenna, sound charger technology, which helps filter out background noise resulting in enhanced sound quality, and 1-way paging between the base and handset. An excellent value at only...

$\$79^{95}$

MODEL
KX-T3850
#1764839

Panasonic

10 CHANNEL CORDLESS PHONE W/ QUICK CHARGE & SECURE GUARD SYSTEM

Panasonic has developed the latest in cordless technology by incorporating a Quick Charge system that will enable you to recharge its battery in one hour providing 7-day standby or 3 hours providing 21-day standby! The Secure guard system can help keep your conversations private and help prevent eavesdropping scanners or baby monitors. Other features include one paging, 10 number memory, last number redial, flash, auto security code settings and much more for only...

$\$118^{95}$

AVAILABLE IN BLACK OR WHITE

MODEL
KX-T 3940
#1820915

Panasonic

10 CHANNEL AUTOSCAN CORDLESS DUAL KEYPAD SPEAKERPHONE W/SECURE GUARD VOICE SCRAMBLING

Panasonic's comes equipped with secure guard which scrambles your voice when others try to listen in on your conversations with other cordless phones, radios or even scanners! Other features include quick charge technology enabling to fully charge the battery in only 3 hours for 21 day standby, 2-way paging, intercom, 10 number memory, high gain antenna, and much more. All for only...

$\$159^{95}$

MODEL
KX-T3965
#1886160

10 CHANNEL SPEAKERPHONES

Panasonic

10 CHANNEL CORDLESS SPEAKERPHONE WITH LCD DISPLAY

WHILE THEY LAST

The LCD on the handset shows the channel number dialed, out-of-range-alert, call duration and more! There's also 10-channel remote change with auto-scanning which automatically scans for a clear channel while in the standby mode or in the base unit! Now only...

ORIGINALLY $\$149^{95}$

$\$99^{95}$

AVAILABLE IN BLACK OR WHITE

MODEL
KX-T3860
#1828496

Panasonic

10 CHANNEL CORDLESS SPEAKERPHONE w/ANSWERING MACHINE

This cordless answering system with sound charger technology delivers sound so clear, you will hardly believe your ears! Some of the features included are, 2- way paging, intercom, auto security system, message alert, 2-way and memo recording just to name a few. Now only...

$\$149^{95}$

AVAILABLE IN BLACK OR WHITE

MODEL
KX-T 4330
#1796483

Panasonic

10 CHANNEL CORDLESS SPEAKERPHONE w/DUAL MICROCASSETTE

This new top of the line cordless dual microcassette answering system with sound charger technology delivers sound so clear, you will hardly believe your ears! Some of the features included are: 2-way paging, intercom, auto security system, message alert, 2-way and memo recording just to name a few. Now only...

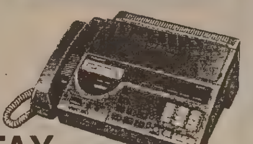
$\$199^{95}$

AVAILABLE IN BLACK OR WHITE

MODEL
KX-T4400
#1735370

FAX MACHINES

Panasonic



FAX MACHINE WITH ANSWERING MACHINE AND ANTI-CURL

This fully featured Fax from Panasonic comes equipped with an auto-logic answering system and anti-curl, as well as copier capabilities. It's the perfect secretary for your home or business!

MODEL
KX-F180
#1877490

$399

Panasonic

FAX MACHINE WITH PAPER CUTTER AND ANTI-CURL

This fully featured Fax from Panasonic comes equipped with an auto-logic answering system and auto paper cutter, as well as copier capabilities. It's the perfect secretary for your home or business!

MODEL
KX-F280
#1886159

$469

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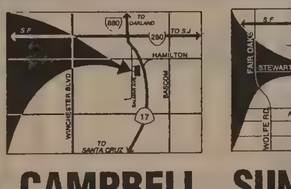

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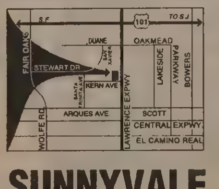

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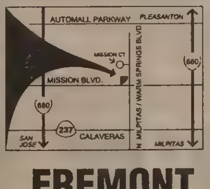

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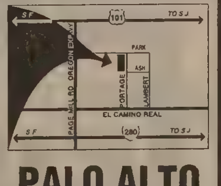
(510) 770-3700



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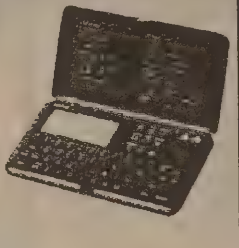


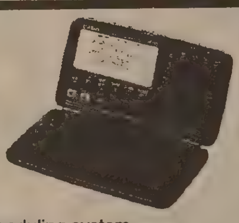
32K DIGITAL DIARY

Why carry around a calendar and schedule book, or a telephone directory and notebook, when you can do it all and more with this digital diary from Casio.

$49.99

MODEL SF-4300
#1647189

CASIO



B.O.S.S. WITH 64KB MEMORY

This business organizer scheduling system comes packed with powerful functions that are practical and easy to use. The QWERTY Keyboard, telephone directory, calendar, memo function, schedule alarm, world time function, home time function, and schedule keeper will prove to be an invaluable tool in keeping your busy days in order. An excellent investment at...

$79.95

MODEL SF-5300
#1671137

CASIO

128K WIDE SCREEN BUSINESS ORGANIZER WITH BUILT-IN SPREADSHEET

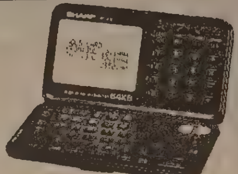
This executive b.o.s.s. incorporates a 40 character by 10 line screen, enabling you to take full advantage of the unit's built-in spreadsheet capability. Other convenient features include: Telephone directory, calendar, business card library, schedule keeper, world time, memo function, weekly schedule, free file function, schedule alarm and a to-do list, just to name a few. Now just....

$179.95

MODEL SF-R10
#1840047

SHARP

SHARP



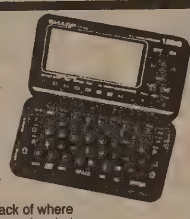
32K ELECTRONIC ORGANIZER

The Sharp YO-300 is a pocket sized, personal information and time management tool that allows you to link it to a PC (with optional acc.). Keep a log of all upcoming projects and sort your list by priority. Track your business and personal expenses and summarize them by day or between days. It also stores birthdays, anniversaries and holiday and provides advance warning for these important events. Stores 1,680 names and numbers or 1,040 schedule appointments.(32K) all for the low price of...

$69.99

MODEL YO-300
#1804027

SHARP



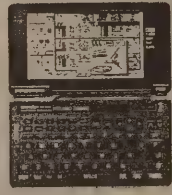
64K BUSINESS ORGANIZER W/ WIDE SCREEN DISPLAY

In today's world, It's sometimes hard to keep track of where you've been, who you've seen, and where you're going, but now it's as easy as saying "S.H.A.R.P!" With this deluxe business organizer; you can store approximately 2,470 names and numbers or 1,740 schedule appointments (128K), but that's just the beginning, the unit's internal memory can be allocated between 10 major built-in functions: An integrated schedule and to do list with 3 different calendar views, 3 phone/address books, business card file, memo pad, outliner, home and world time clocks, and a calculator.You can send/receive electronic mail using built-in terminal emulation software and an optional PC modem, as well as, exchange data with your PC or Mac using an optional PC interface software and cable package. A must for any business person on-the-go at only...

$179.95

MODEL YO-600
#1753455

SHARP



512K PERSONAL ORGANIZER w/TOUCH SCREEN TECHNOLOGY

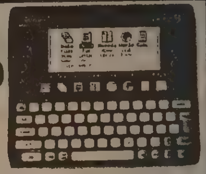
This Sharp Wizard lets you leave your portable computer at home but puts the power of that computer in your pocket! Here's a small sampling of the innovative features. Touch screen technology which allows you to write or draw on the screen using the Wizard pen, filer which organizes related data into folders that can be transferred to another touch screen Wizard via infared, and a true word processer with a large screen display and a keyboard that's 75% the size of a standard PC keyboard. The possibilities are endless at only...

$399

MODEL OZ-9600 II
#1797152

PALMTOPS

PSION SERIES 3



POCKET SIZED 256KB COMPUTER W/ BUILT-IN SPREADSHEETS

Psion has redefined the state of the art in hand held computers with the new Series 3. It may be small, but this pocket-sized programmable computer comes equipped with features found in desktop machines plus powerful built-in software, including a full specification word processor and outliner that's compatible with Microsoft word. When using the Series 3 you will quickly learn from the system of graphic displays and option list how easy the Series 3 is to use. And with Psion's unique Multitasking Operating System, as many of the facilities as you want can be used at the same time! Other features include an automatic phone dialer, world information, a time and personal management file, powerful graphics programming language (OPL/w) which will enable you to write your own applications and two expansion ports for plug in SSD devices for unlimited memory and software.

$299

MODEL SERIES 3
#1763861

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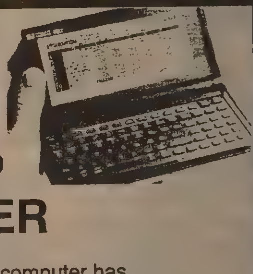
Authorized Dealer



512K PALMTOP COMPUTER

This amazing palm top computer has Lotus 1-2-3, Word Processor, Data Base, Appointment Scheduler and 512KMB memory. Truly an incredible product, supply is limited. Get yours now for only...

$399.99

MODEL HP-95LX
#1584442

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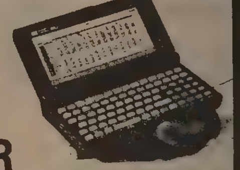

1MB PALMTOP COMPUTER w/80 x 25 FULL SCREEN MS-DOS 5.0

The smallest, lightest HP PC ever comes equipped with complete organizer software to manage your time, tasks and data, plus you can retrieve information instantly with a full range of built-in personal productivity tools. The pull-down menus and dialogue boxes make it simple to master the familiar commands, and the high-resolution display with zoom option is easy to read! With Lotus 1-2-3 built-in you will have full spreadsheet capability, including graphics and macros. Also includes CC:Mail built-in. Now only...

$449.99

MODEL HP-100LX
#1788150

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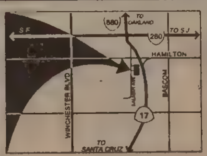

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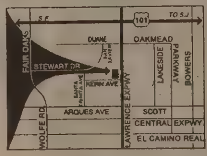

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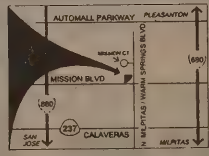

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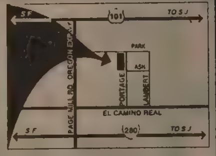

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ALL DIGITAL ANSWERING MACHINES

GENERAL ELECTRIC
GE We bring good things to life

ALL DIGITAL ANSWERING MACHINE
WITH THREE MAIL BOXES

With three mailboxes to choose from, members of the household can have messages stored for them in their own mailbox! The all digital capability eliminates the need for moving parts and allows for instant playback of incoming messages-no need to wait for a tape to rewind or fast forward! Other features include voice time/day stamp, two outgoing messages, digital counter, selective message erase and much more for only...

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#1839261

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TELEPHONE
W/ ALL DIGITAL ANSWERING SYSTEM

G.E's newest telephone answering machine offers 10 Minutes of record time digital message counter, voice time/day stamp, auto disconnect, selective save message, and 12 number memory, an excellent investment at...

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MODEL 2-9831
#1743555

SONY.

ALL DIGITAL ANSWERING MACHINE
W/ VARIABLE SPEED MESSAGE PLAYBACK

Sony has taken digital technology to a new dimension with this beautifully-designed, all digital answering system. The variable-speed message playback controller allows you to speed up (to 1.6 times speed) or slow down (to 0.7 speed) playback of messages without changing pitch. In addition, you can skip, repeat or backspace messages. The multi-function LCD display functions as a digital message counter, clock, call timer, answer mode indicator, and back-up battery strength indicator, while the voice time/day stamp automatically records the time of the message receipt after each message. Other features include: Voice-guided operation, Pre-recorded greeting, Announce-only mode, Memory usage guage, Audible message alert, Remote on/off, Auto interrupt, Memo recording, 2-way conversation recording, and Adjustable ring delay. An invaluable addition to any home or office at only...

$\$129^{95}$

MODEL
TAM-1000
#1803901

Panasonic

ALL DIGITAL 4 MAILBOX ANSWERING SYSTEM
W/SPEAKERPHONE & VOICE TIME/DAY STAMP

Panasonic's fully featured answering system comes equipped with 30 minute storage capacity, voice time/day stamp, speakerphone, voice menu, 4 personal mailboxes with security, lcd display, message scan, programmable alarm, message transfer, 2-way record, selective message delete, message skip/repeat, auto disconnect, auto redial, 10 number memory, and much more! An invaluable addition to any home or office at just...

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MODELKX-T2880
#1841989

MULTI-LINE BUSINESS PHONES

Panasonic

TWO LINE SPEAKERPHONE

A perfect compliment to your home or office, this two-line speakerphone comes equipped with 3-way conferencing, 20 number programmability, seperate ring switches for each line, and a local mode function. Now only...

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MODEL KX-T3120
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SONY.

TWO LINE FEATURE PHONE
WITH SPEAKERPHONE

Phones with 2-line operation are relatively common, but this phone offers a distinctive ring for each line! The LCD indicator will tell you the number dialed and the time. Now only..

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MODEL IT-D250
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Southwestern Bell Freedom Phone

THREE LINE SPEAKERPHONE

Convenient is the only word to describe this 3-line speakerphone. With call waiting, intercom paging, 16 number memory, last number redial, and conferencing, this phone is an incredible value at only...

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MODEL FT-38
#1668348

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FOUR LINE SPEAKERPHONE
WITH LCD DISPLAY

From Panasonic comes this fully featured 3-line speakerphone with LCD display, 3-way conference call, volume control for speaker and handset, 48-station one-touch dialer, auto redial, flash, separate ringer tone, line status indicator, memo dial, and save redial, all for only...

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MODEL KX-T3185
#1768039

COPIERS

SHARP.

PORTABLE COPIER

This Sharp copier weighs in at just 14.8 lbs. and is amazingly compact and lightweight, making it easy to be carried or stored in a small place. Features include auto exposure control, auto start function, auto power shut-off mode, which completely cuts the power approx. 90 sec. after you finished copying. An excellent value at only.....

$299

MODEL Z-20
#1885620

Canon

COMPACT COPIER

The size of Canon's compact personal copier makes it perfect for the home or office where space is at a premium. Some of the convenient features of this model includes the ability to copy on both sides of copy sheets, exposure control, and more. Now just...

$399

MODEL PC-310
#1849208

XEROX

LETTER /LEGAL COPIER

Don't settle for a copy when you can have the original... Xerox. Xerox is so confident in the quality and reliability of its copiers that it offers an exclusive 3 year warranty on all its copiers. This model offers a paper tray that stacks 40 sheets, a built-in carrying handle and removable storable paper trays, multi-copy capability which can be set from 1 to 9 copies or "C" for continuous up to 20 copies, and automatic exposure which scans documents for degrees of lightness or darkness to determining the appropriate exposure setting. An invaluable addition to any home office. At only...

$497

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#1886425

XEROX

COPIER
W/STATIONARY PLATEN & REDUCTION/ENLARGEMENT

If you're looking for versatility and premium performance in a copier your search is over! Xerox has designed a copier that incorporates reduction/enlargement technology enabling you to reduce a copy 75% and 95%, an d enlarge to 124%, a 250 sheet paper tray which adjusts to hold memo to letter to legal size paper, built-in automatic exposure which scans documents for degrees of lightness or darkness to determine the appropriate exposure setting, multi-copy capability of 1to 50 copies, letter and legal size copying, and manual bypass, all backed by the experts at team Xerox. Now just...

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MODEL 5310
#1782659

FAX MACHINES

SHARP.

FAX
WITH DOCUMENT REDUCTION CAPABILITIES AND PAPER CUTTER

Sharp's unique time and paper-saving functions offer several compressions methods to minimize time and paper consumption. The effective size of outgoing documents can be reduced by 20% for faster transmission. And for incoming faxes, it can be set to ignore unprinted areas or reduce documents by 50%. Other features include 50 number memory, 10 page document feeder 16-level halftone and much more, all for only.....

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MODEL UX-174
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brother.

FAX MACHINE
W/PAPER CUTTER & 32 LEVEL GREY SCALE

Brother's breakthrough fax machine incorporates newly developed therma plus technology which uses fax paper that feels like plain paper and reduces print fading (last 3 times longer than thermal paper under normal filing conditions, and you can even use a highlighter!). Other features include, 15 page document feeder, 160 station memory, 32 level grey scale, activity report, polling and much more for only...

$379

MODEL FAX-680
#1794481

AT&T

PERSONAL FAX
W/ DIGITAL MESSAGE CENTER

Compact in design. Practical in functionality. This personal fax with all digital answering machine and auto paper cutter will fit as comfortably on your desk at work as it will your kitchen counter! With two-way digital speakerphone, 5 page document feeder, 12 one-touch dialing numbers and 30 auto dial numbers, on hook dialing, polling, resolution and contrast control, transmission terminal identification, delayed transmission polling and 98' paper roll capacity, AT&T has developed the ultimate fax for the home or office at just...

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PLAIN PAPER FAX MACHINE
W/256 KBYTES OF MEMORY

This plain paper fax offers 256 Kbytes of memory, a 20 page document feeder, 32 gray scale levels, 100 page capacity with easy front reloading, 12 page memory, plus many more outstanding features for only...

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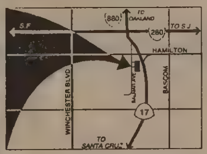

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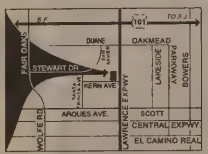

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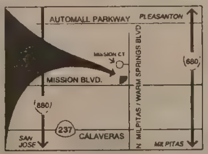

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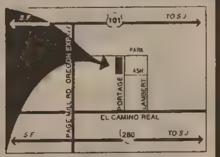

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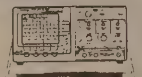
Tektronix



100MHz ANALOG 2 CHANNEL OSCILLOSCOPE

THE TAS 465 brings an advanced level of power and reliability to general purpose scopes. It brings leading edge innovation to low-cost analog scopes with comprehensive features. Comprehensive Video Triggering simplifies triggering on complex video waveforms. With line or field (odd, even, or both) composite video selections and positive or negative sync, you can cleanly trigger on any NTSC, PAL, or SECAM video signal. The scopes' dual time base lets you zoom in on any portion of a waveform for closer examination. Auto Setup instantly delivers meaningful waveforms. Pressing the AUTOSET button automatically adjusts the horizontal, vertical, and triggering controls so that a stable signal is displayed.

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TAS 465
#1823505

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50Mhz OSCILLOSCOPE

With Single Time Base & High Resolution CRT. The usefullness of Hitachi scopes is extended to cover an array of new measurement applications.
2 channel • 6 inch screen
3 Year Warranty.

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V-522
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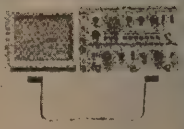
GoldStar



20MHz SCOPE W/BUILT-IN FUNCTION GENERATOR

1MHz Function Generator with three kinds of waveforms are available w/50ohm output and TTL Pulse. Two channels- single time base. Ideal for education applications. 1MHz fuction generator built-in this 20MHz, two channel scope. Sine, Square, Triangle and TTL Pulse output waveforms.

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OS-9020G
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20MHz DUAL-TRACE OSCILLOSCOPE

Dual or Single Trace Operation+1mV/DIV Sensitivity
20MHz Response at a true 3DB
Auto/Norm triggered sweep operation with AC TVH TVV and the coupling
x10 magnifier • Bright, sharp rectangular CRT with P3331 phosphor X-Y operation

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BK-2120
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FLUKE 87 4.5 DIGIT TRUE RMS DIGITAL MULTIMETER

19,999 Count high resolution mode, plus 1ms Peak Min/Max Hold.

- Min/Max/Average recording mode w/Min/Max alert
- Frequency, Duty Cycle, and Cap Measurements
- Back-lit display, touch hold, relative modes
- Protective Holster with Flex stand
- Made in USA
- 3 Year Warranty

$298

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THE CHIEF ENGINEER ULTIMATE METER TRUE Rms - LCR-Hz - dBm 12 INSTRUMENTS IN ONE

- DC Volt Meter
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- DC Current
- AC current
- Diode Tester
- Audible Continuity Tester
- Frequency Counter 20MHz
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- Inductance Meter
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IOMEGA Ohm Impedence • Relative mode
Data hold • Min/Max Average Memory Record
True Rms • Auto sleep • Power off
2 Year warranty
Model 104
#1776719

S.M.S.

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Protek

DC POWER SUPPLY

A high quality DC power supply featuring a unique owner savings design for cooler and more efficient operation. Two separate LED displays; green readout for voltage and red for current. Continuously variable with LED indicators signaling either constant voltage or constant current operational mode. Good Line, load regulation plus low ripple and noise makes this a fine compliment to any test bench.

DC OUTPUT
30V @ 3A

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3003
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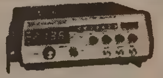

2 MHz FUNCTION GENERATOR WITH DIGITAL DISPLAY

- Generates sine, triangle, square, pulse and ramp waveforms
- TTL Pulse and CMOS Pulse outputs
- Coarse and Fine Frequency Controls
- Variable amplitude output, plus 20dB step attenuator
- Four digit frequency counter display
- Variable DC offset, with on-off switch
- Variable duty cycle; CAL position for 50% duty cycle

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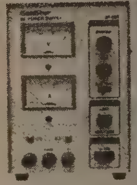
MODEL
3011B
#1460267

GoldStar



DC POWER SUPPLY

0-30 volts @ 3 amps Continuously Variable. Rugged Construction with Constant Current and Constant Voltage Operation. Overload protection circuit. Output Polarity: Positive and Negative. Low Ripple Voltage Less Than 2mV p-p.

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GP-303
#1864678

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3.75 DIGIT DIGITAL MULTIMETER

w/AUTORANGING & 1 YEAR WARRANTY

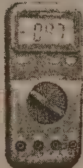
- True Rms AC
- Auto Data Hold
- Sleep Mode
- Min/Max Memories
- Relative Mode
- 20A Fused
- Frequency Counter
- Capacitance
- Memory Read Function
- 0.3% Basic Acc.

AR-MODEL 37 #1742369

FREE BOOT W/PURCHASE #1744648

$99.95

AMERICAN RELIANCE INC.



3.5 DIGIT DIGITAL MULTIMETER

W/AUTORANGING & 1 YEAR WARRANTY

Model 33 is a versatile digital multimeter with an impressive range of capabilities offered at an incredible price. This unit has data-hold functions and a basic accuracy of 0.5%, also audible continuity and fused 20A input.

Model 33
#1742347

FREE BOOT W/PURCHASE #1744648

$59.95

BK PRECISION
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3.5 DIGIT TOOL KIT MULTIMETER

HOT!

- Measures voltage, resistance and current
- 0.5% DCV accuracy DC current to 10A
- Resistance, 0.1 to 20M
- Diode Test
- Drop resistant case

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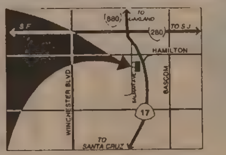

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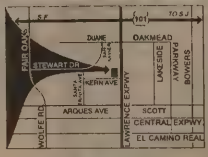

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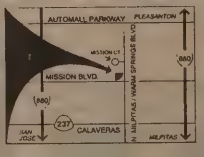

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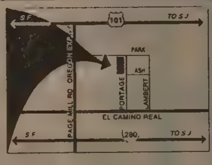

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HAKKO 470 DESOLDERING TOOL

The Hakko 470 is designed for great thermal supply and suction power- as well as provide protection against electrostatic discharges and electrical surges-making them ideal tools for safety and efficiently desoldering multi-layer boards. #1852709

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HEAT GUN

An economical, lightweight, multi-use heat gun for heat shrink tubing. Features:
- 2 Heat Settings - 500°F and 1,000°F
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- Built-In Hand Guard
- 3-Wire Grounded Cordset
- UL Listed
- Thermoplastic Case
- 1 Year Limited Warranty
- 120 Volts AC
- 1200 Watts Max. #1790270

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QVS COMPUTER SERVICE KIT

Contains an assortment of specialty tools for computer service. Includes chip extractor, assembly tweezers, three clawparts retriever, four screwdrivers (two, slotted, two Phillips), two nut drivers and a torx screwdriver neatly stored in a zippered vinyl carrying case.

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CA215L
#1780794

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RITE-OFF E626-6oz.
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CFC FREE!

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AERVOE™ CONTACT CLEANER

Use to clean and remove dirt from electrical/electronic components, circuit boards, switches, timers and motors. Evaporates quickly without oxidizing or leaving a cross-circuiting residue. High dielectric strength.
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platt TROUBLE SHOOTER TOOL CASE

Black cordura with two exterior meter pockets and one document pocket. Interior has 29 sewn tool pockets and one meter pouch.
13" x 10" x 2". 660ZT-BLK #1790199

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KLEAR SCREEN COMPUTER SCREEN CLEANER

- Convenient Packets
- Non-toxic
- Alcohol free
- Ammonia free

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6 PACK
#1809778

50 DRAWER STORAGE CABINET

See-thru drawers
Stackable frames
Recessed tray top • Pedestal base
Keyhold hanging slots
Gray pebble grain finish
Model 10-350
#1541399

AKRO-MILS

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30 WATT SOLDERING IRON

#1842968

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AERVOE™ MicroTorch & Solder Kit

An instant ignition adjustable flame torch powered by butane fuel with its own 1.5 fluid oz. storage tank. Hand-held, free-standing design for workshop, daily and recreational use. Solder attachments makes this torch a 5-in-1 multi-purpose tool.

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1250
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That's right, we said stereo! Just connect a cassette deck, CD player or mixer panel to the FM-10's live level inputs and your on-the-air with a school, dorm, camp, home or neighborhood FM station. Do it yourself soldering/assembly and education. Come see our selection of other kits too.

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FM-10
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MicroApps PERMANENT POWER PACK™

PREVENT PC FAILURE DUE TO A DEAD BATTERYYour PC will fail to boot up unless it contains the Patented Permanent Power Pack from MicroApps. Virtually all other PCs have a dying battery which causes real time Clock Failure and Loss of the System Configuration File. Thus, your PC will unpredictably fail to boot every few years. The lifetime guaranteed Permanent Power Pack eliminates the clock battery in IBM PC/AT and most compatibles. Never replace your PC battery again. IC controlled power management system makes your PC more reliable and carries a lifetime warranty.

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Model PPP-001
#1660638

FOCUS 140 WATT CONTINUOUS DC TO AC INVERTER

12vdc to 110vac • Low Battery Alarm
Electronic Circuit Protection
High Surge Current Capacity

$\$49^{99}$

PC140
#1732698

FOREIGN TRAVEL TRANSFORMER REVERSIBLE UP TO 1000 WATTS!

Step-Up/Step-Down Foreign Voltage Transformer. Constant Duty Transformers/Reversible. 110VAC/220VAC or 220VAC/110VAC. Ideal for travel or for using overseas products here. Available in 50W, 100W, 200W, 300W, 500W, 1000W

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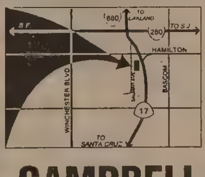

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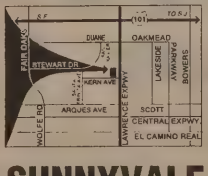

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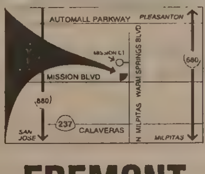

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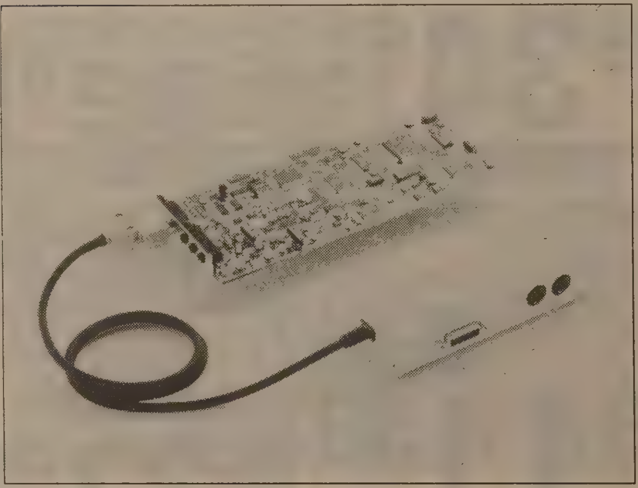

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The WIDEfax 36 is a combination 36" scanner, plotter, copier, and facsimile designed to address large-document and communication needs. The high-speed, large scanner can scan an E-sized (36" x 48") document and

UPDATES

✣ **Avantos Performance Systems** is shipping **ManagePro 2.0 for Macintosh**, an easy-to-use tool for helping managers and workteams stay on top of goals and deadlines, manage people more effectively, and stay organized. Avantos Performance Systems, Inc., 5900 Hollis St., Suite C, Emeryville, CA 94608. 1-800-282-6867.

✣ **ClarisWorks 2.0 for Macintosh** is now available in a special **English/Spanish bundle** for the Education market. The bundle consists of both English and Spanish versions of the product, offering identical features and user interfaces. Claris Corp., Claris Education Sales, 1-800-747-7483.

✣ **Claris** announced it has ceased development of the **Claris Resolve** spreadsheet application and will not sell it after March 31, 1994. Claris will continue to provide technical support for registered Resolve users through March 31, 1995. Claris is offering current Resolve users **ClarisWorks 2.1** for a special price of $29 in the US through September 30, 1994. Claris Corp., 5201 Patrick Henry Dr., Box 58168, Santa Clara, CA 95052. 1-800-544-8554.

✣ **Davidson & Associates** released the DOS version of **Spell It 3**, a major upgrade to Spell It Plus. Upgrades for users of any previous Spell It version are available from Davidson for $19.95 plus shipping and handling and applicable sales tax. Davidson & Associates, Inc., 19840 Pioneer Ave., Torrance, CA 90503. (310)793-0600.

✣ **Horizons Technology** introduced **LANshadow 4.0** mirroring software, featuring a new Windows user interface, a price tag below $1000, and several key enhancements designed to make the program easy to use. Horizons Technology, Inc., 3990 Ruffin Rd., San Diego, CA 92123. 1-800-828-3808.

✣ **Inline Software** shipped an upgrade to **Redux Deluxe**, its backup program for the Macintosh. In addition, **StuffIt Deluxe** is being bundled with Redux Deluxe 2.5. Inline Software, Inc., 308 Main St., Lakeville, CT 06039. 1-800-453-7671.

✣ **Logitech** reduced the pricing on its high-performance **MouseMan PC Corded** line by more than 50%. The MouseMan corded right- and left-handed device has been reduced to $49.95. MouseMan Bus has been reduced to $79.95, and the MouseMan Cordless is now $109.95. Logitech, Inc., 6505 Kaiser Dr., Fremont, CA 94555. (510)795-8500.

✣ **Microsoft Corp.** released **Microsoft Money 3.0**, a new version of its personal finance software for Windows, with technology that enables the remote delivery of financial services. Users of Microsoft Money 2.0, Excel, and Works can get $5 off the suggested retail price with an in-box rebate coupon. Microsoft Corp., One Microsoft Way, Redmond, WA 98052. (206)882-8080.

✣ **Q/Media Software** introduced **Q/Media for Windows Release 2.0**, an affordable, easy-to-use, interactive multimedia authoring tool. Q/Media Software Corp., 312 E. 5th Ave., Vancouver, B.C., Canada V5T 1H4. (604)879-1190.

✣ **Sun Microsystems** announced that it is bundling **Lotus Notes** at no charge with every SPARCserver shipped in the US through June 30, 1994. Customers receive a coupon for Lotus Notes software plus six licenses. Sun Microsystems Computer Corp., 2550 Garcia Ave., Mountain View, CA 94043. 1-800-346-1305.

✣ **2010 Software Corp.** introduced **Sherlock 2.0**, an enhanced version of its file finding management software for Windows. 2010 Software Corp., 1-800-952-2314.

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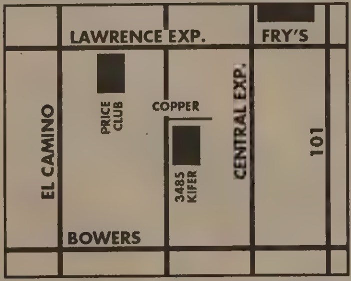

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Books

THE INTERNET CONNECTION

The Internet Connection: System Connectivity and Configuration, by John S. Quarterman and Smoot Carl-Mitchell, is the reference guide that explains how to connect to the Internet, step by step, from finding a connection through registering a domain and a network number, through configuring your TCP/IP protocols, to running your own domain server and setting up your mail and news systems. The book includes brief overviews of Internet services and protocols, and it briefly describes what the Internet is and is not, and how it differs from other networks. However, the authors assume that the reader already knows about those other networks, knows about Internet services, and already wants to connect to the Internet. This book shows how to do that. ($29.95) Addison-Wesley Publishing Co., Reading, MA 01687. (617)944-3700.

SIMCITY 2000: POWER, POLITICS, AND PLANNING

SimCity has already stepped into the twenty-first century where power, politics, and planning still combine to make a city thrive or decay—and its leaders have been playing with the reality of tomorrow without a solid guide. *SimCity 2000: Power, Politics, and Planning*, by Nick Dargahi is the guide that will allow today's SimMayors to be ruling their dream cities as quickly, easily, and painlessly as possible. The book covers Macintosh and DOS versions of SimCity 2000—including tips for running the DOS 1.1 and OS/2 versions of the game in Windows. ($19.95) Prima Communications, Inc., PO Box 1260, Rocklin, CA 94577-1260. (916)786-0426.

Mac Hardware

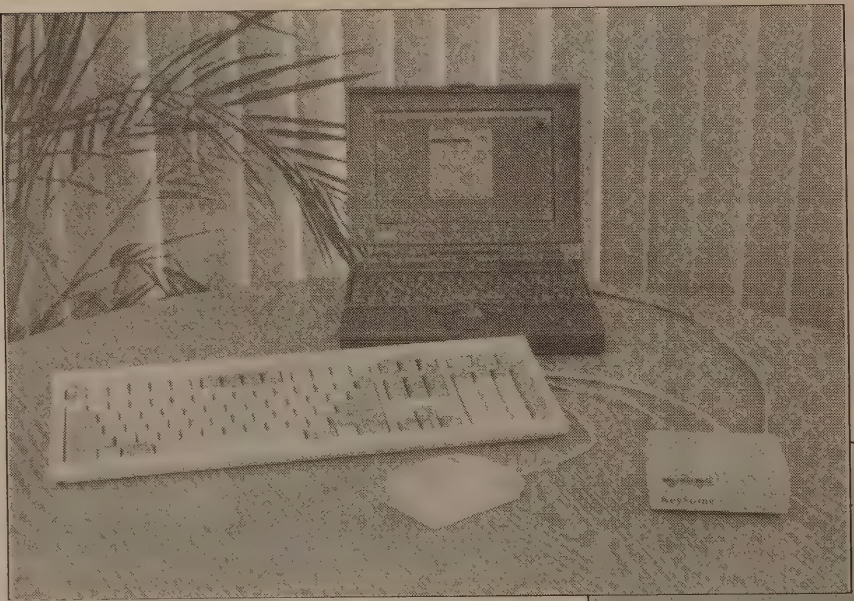
KEYSTONE INTERFACE UNIT

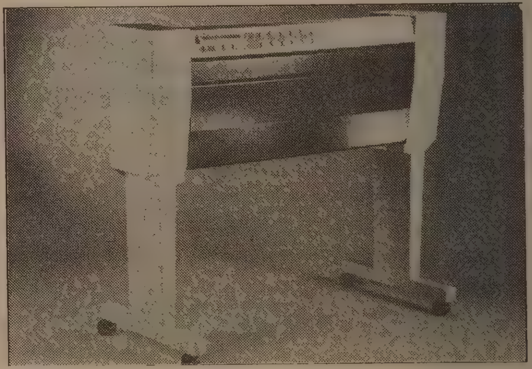
Now you can use a PC-compatible keyboard, mouse, trackball, and other devices for your desktop Macintosh or PowerBook. Just plug the keyboard and mouse into Keystone and then plug Keystone into the ADB socket on your Mac. Keystone even has a "startup" button, missing from PC keyboards, and an extra ADB socket. Keystone's control panel software enables you to use a three-button mouse or trackball and map custom commands to all three buttons. ($90) Silicon Valley Bus Co., 475 Brown Rd., San Juan Bautista, CA 95045. (408)623-2300.

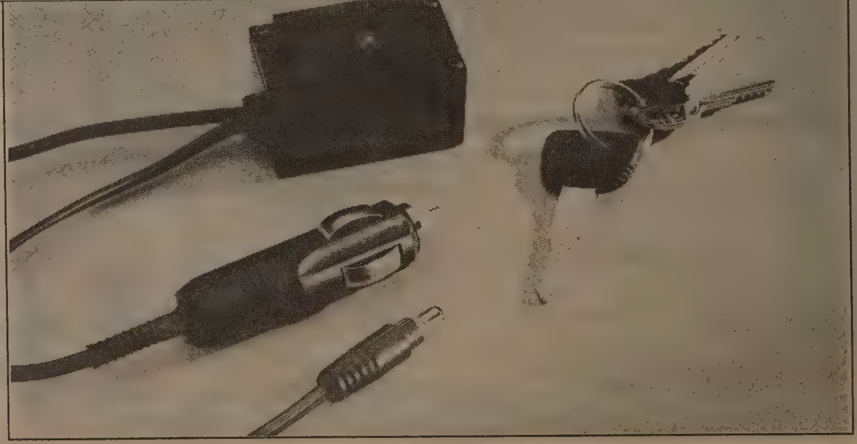
POWER TRAVELER DC ADAPTER

With Power Traveler DC Adapter, PowerBook owners can operate and recharge their computers from any standard auto cigarette lighter. One-sixth the size of standard PowerBook adapters, this portable, compact adapter weighs only 5oz. Without the need for a bulky converter or transformer, it converts voltage from a car battery via the cigarette lighter to the regulated 7.5V output necessary to operate a PowerBook. An LED display lights up to indicate that the computer is receiving the correct level of voltage. ($79.95) Kensington Co., 2855 Campus Dr., San Mateo, CA 94403. 1-800-535-4242.

Clockwise from upper left: Keystone interface unit from Silicon Valley Bus Co.; Widefax from the WideCom Group; Kensington Co.'s Power Traveler DC Adapter.







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REVIEWS

Game Reviews

SHADOW CASTER

Designed By: Raven Software
Published By: Origin
For: IBM PC compatible, 386, 4MB RAM, Microsoft/Logitech mouse, 16MB available on the hard drive, MCGA/VGA, Sound Blaster/General Midi
List Price: $54.99
Reviewed By: Fred Haslam

Shadow Caster is a point-of-view dungeon game done right. It uses a flight simulator engine to let the player move with great realism. You can creep forward, peek around corners, or dash madly through a room dodging fireballs and monsters. This type of game has been done once before by Ultima Underworld. Shadow does it again with panache.

The key twist to Shadow is that your character is a shape-changer. You begin as a human, fighting off monstrosities with your fists and feet. Quickly you gain the ability to transform into the Maorin, a four-armed werewolf of great power. The transformation sequence alone is worth the price of admission. The Maorin has a weakness though. It floats like a bucket of mud—not at all. Later you gain the form of the Kahpa, an upright frog, which can breathe underwater. Over the course of the adventure you learn to transform into six different creatures, and you learn to switch between them to take advantage of their diverse powers.

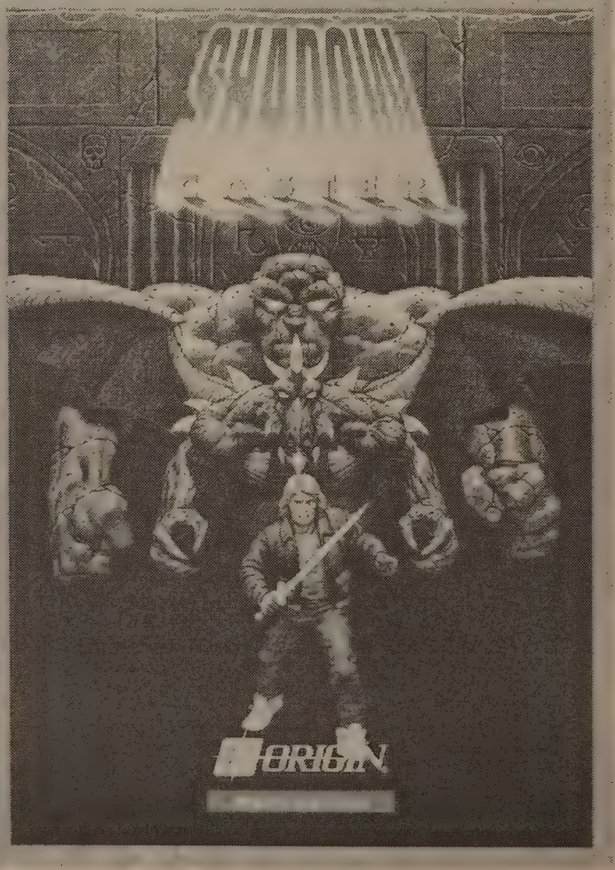
The interface for Shadow Caster takes some getting used to. Reading over the quick reference card is enough to get started. Learning to use all the controls takes practice. The graphics are marvelous and varied—this game embodies a *lot* of work. The music is pleasant and unobtrusive, changing during combat to indicate enemy status. The sound effects are both good and useful. The best indicator that you are hit is when your character growls, grunts, or whines (depending on its form).

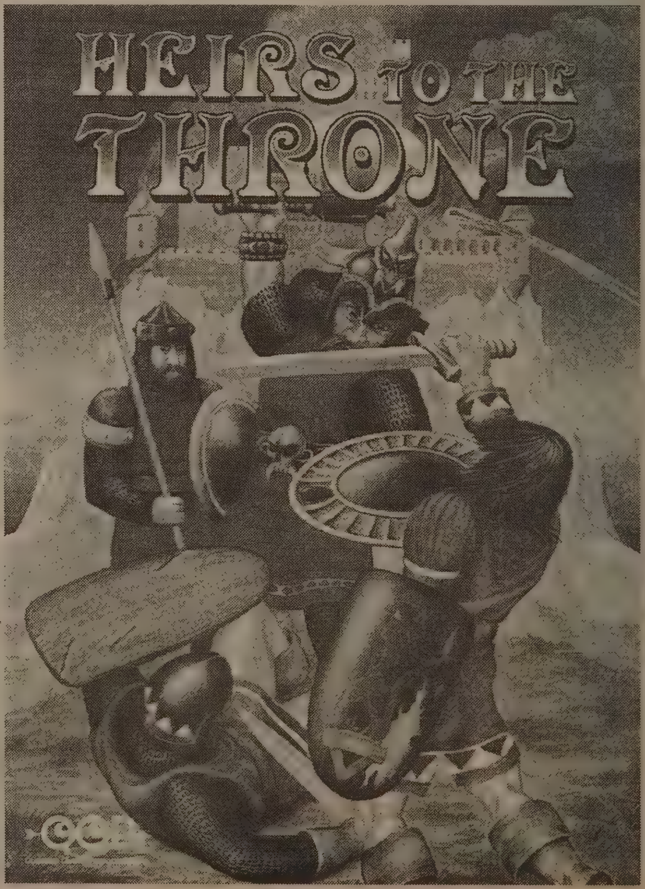
As a dungeon game, Shadow is clever and balanced. Your character improves just enough to keep the game challenging. The puzzles are tricky, but not frustrating. The mechanics of the RPG are hidden away from the player. All you see are hit points, magic points, and an occasional message indicating that you have gained a level. I highly recommend this game with one word of caution. If you have trouble with arcade games, you may have some trouble coordinating actions in Shadow Caster. (Origin, Inc., PO Box 161750, Austin, TX 78716. 512/335-0440)

HEIRS TO THE THRONE

Designed By: R.K. Rien
Produced By: German Design Group
Published By: Quantum Quality Productions
For: IBM PC compatible, 640K RAM, DOS 3.3, hard drive, EGA/VGA, mouse
List Price: $44.99
Reviewed By: Fred Haslam

Heirs to the Throne is a maddeningly addictive medieval strategy game. I use those words with exactitude—this





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-32 Bit VLB IDE Controller with 2S/1P/1G
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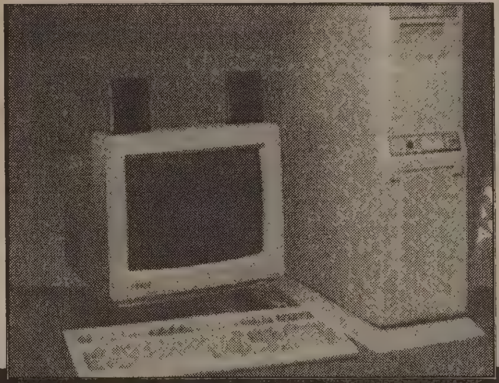

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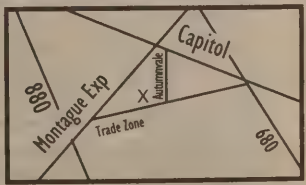

European import is both maddening and addictive. The game is addictive in the "I'll just do one more turn" manner. Just-one-more-turn usually becomes several dozen turns and takes over an evening.

The game is definitely maddening. There is no real difficulty setting, so even the easiest game pits you against full computer strategy. It is difficult to win no matter what settings you use. Even worse, sometimes you know you can win, but it will take you several *hundred* turns to do so.

At first I thought this game was a simple "build the armies and attack," but the computer opponents maneuver their men with great care. They only attack when they will win and withdraw when they would lose. The game becomes intricate and chess-like, very much like warfare during the time of Frederick the Great. Although the computer opponents are nearly automatic, the presence of three foes introduces an element of chaos. It is possible to enter into stable, static situations. It is equally possible to find armies shifting back and forth with alacrity.

The interface is non-intuitive. You must read the rules to understand what to do. You must constantly indicate when you want to make *another* attack or *another* move. You can make a simple mistake this way and blow your whole game. Fortunately, everything is mouse driven, the one bright spot in the interface. The music is good and can be turned off (unlike some European imports). The artwork is of poor quality, mostly consisting of digitized drawings. It is possible to play the game with up to three friends.

As a strategy game, Heirs is complex in its simplicity. It can be described with some accuracy as Combat Go. I recommend the game to staunch strategy gamers, but not to newcomers. The interface is frustrating and requires patience. The game is harsh and unforgiving. Being a staunch strategy gamer, I enjoyed it tremendously. (Quantum Quality Productions, 495 Hwy. 202, Flemington, NJ 08822. 908/788-2799)

OXYD MAGNUM

Designer: Meinolf Schneider

Publisher: Dongleware Publications, Inc.

For: IBM 386, DOS 5.0, 2MB of RAM, VGA, mouse, Sound Blaster/Adlib

List Price: $44.99

Reviewed By: Fred Haslam

I must qualify this review by pointing out that of the one hundred puzzle levels in Oxyd Magnum I was able to complete three. The fourth level required a degree of skill and patience that was a magnitude beyond what I possessed. Further, there was no way to skip levels to get a look at future puzzles.

The mechanics of the game are simple and easily understood. You move a marble through a map using the mouse. The marble bumps into towers revealing colors. When the colors of two towers match, both stay revealed. If not, the previous tower closes again. At its most

Continued on page 234

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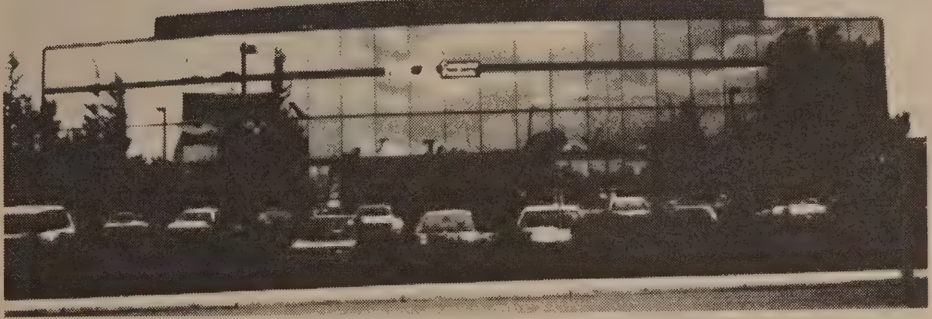

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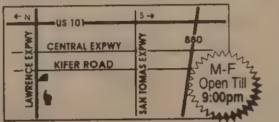

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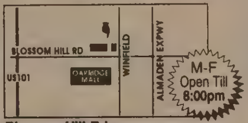

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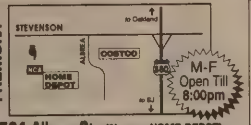

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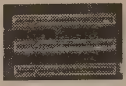

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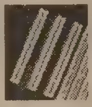

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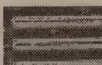

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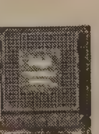

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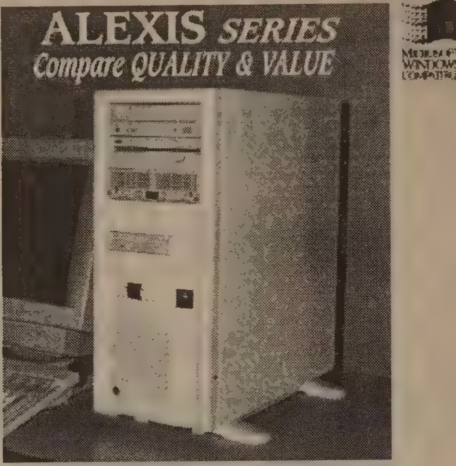

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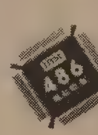

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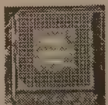

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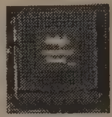

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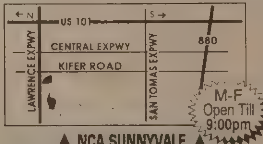

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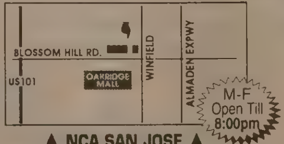

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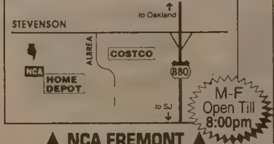

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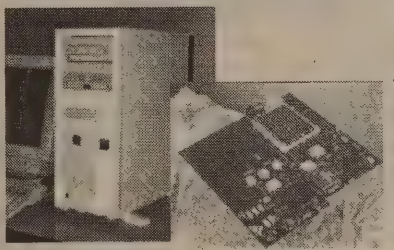

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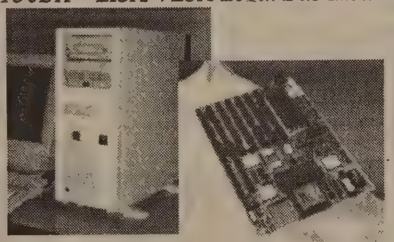

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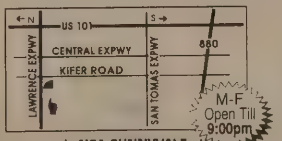

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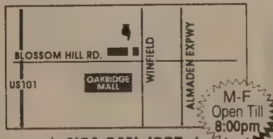

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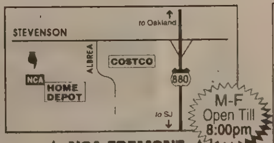

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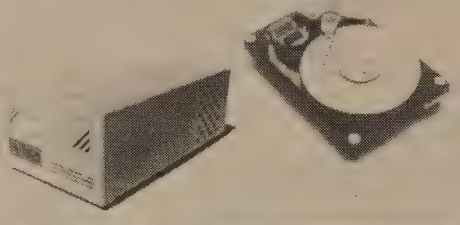

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250MB IDE............$208
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340MB IDE............$269
13ms, CFA340A

420MB IDE............$295
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340MB SCSI	$319	$429
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540MB SCSI	$494	$614
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1.0GB SCSI	$759	$869
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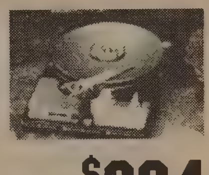

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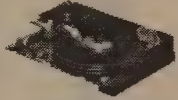

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Fast SCSI-II

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1.6GB	**3160S**	**3.5"**	**5400**	**9.5ms**	**$1194**	**$1319**
2.1GB	**3210S**	**3.5"**	**5400**	**9.5ms**	**$1639**	**$1749**
2.0GB	**5200S**	**FH**	**3600**	**12.5ms**	**$1179**	**$1379**
3.5GB	5350S	FH	5400	11.5ms	$2699	$2899
4.0BG	5400S	FH	5400	11MS	$2899	$3099

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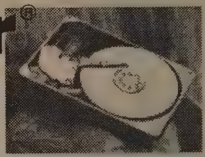

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345MB SCSI.............$337
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540MB SCSI...$568
MXT-540S, 8.5ms, 256K Cache, 2 Year Warr.

1.2GB SCSI..............$1195
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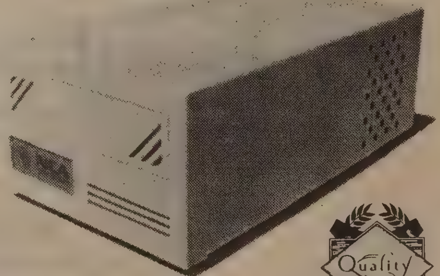

Quality

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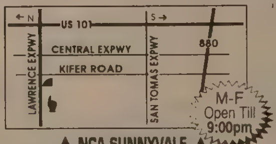

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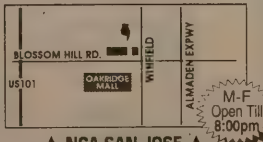

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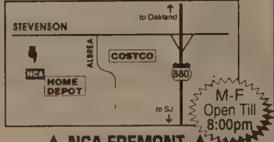

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CAPACITY	M/N		SPEED	SIZE	PRICE
127MB	GLS127AT	FOR NOTEBOOKS	17ms	2.5"X17mm	$249
170MB	GLS170AT		17ms	2.5"X17mm	$279
256MB	GLS256AT		17ms	2.5"X19mm	$369
170MB	ELS170A	32K	17ms	3.5X1"	$179
270MB	**LPS270A**	**128K**	**12ms**	**3.5X1"**	**$218**
340MB	**LPS340A**	**128K**	**Fast**	**3.5X1"**	**$258**
540MB	**LPS540AT**	**128K**	**12ms**	**3.5X1"**	**$434**

SCSI

CAPACITY	M/N		SPEED	SIZE	PRICE
127MB	GLS127S	FOR MAC POWERBOOKS	17ms	2.5"X17mm	$269
170MB	GLS170S		17ms	2.5"X17mm	$289
256MB	GLS256S		17ms	2.5"X19mm	$379

CAPACITY	M/N	CACHE	SPEED	SIZE	INTERNAL	EXTERNAL
170MB	ELS170S	32K	17ms	3.5X1"	$199	$329
270MB	LPS270S	128K	12ms	3.5X1"	$269	$379
340MB	LPS340S	128K	FAST	3.5X1"	$299	$409
540MB	LPS540S	128K	12ms	3.5"X1"	$498	$609
1.0GB	PD1050S	512K	10ms	3.5"	$869	$979
1.0GB	PD1080S	X	9.5ms	3.5"X1"	$769	$879
1.2GB	PD1225S	512K	10ms	3.5"	$939	$1049
1.8GB	**PD1800S**	**512K**	**10ms**	**3.5"**	**$1099**	**$1219**

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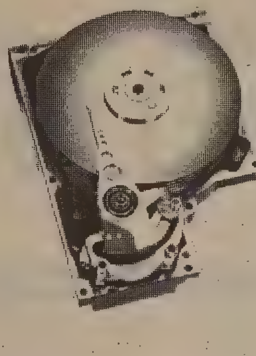

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- 7200RPM
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- 7200RPM
- Fast SCSI-II
- 500,000MTBF

INTERNAL $1899

EXTERNAL $2059

ST12550W Fast Wide SCSI-II....$1999

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CAPACITY	M/N	CACHE	SPEED	SIZE	PRICE
245MB	ST3283A	128K	12ms	3.5"X1"	$299
263MB	ST3290A	64K	16ms	3.5X1"	$249
341MB	ST3391A	256K	12ms	3.5X1"	$298
452MB	ST3550A	256K	12ms	3.5X1"	$449
525MB	ST3600A	X	12ms	3.5X1"	$Call

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CAPACITY	M/N	CACHE	SPEED	SIZE	INTERNAL	EXTERNAL
343MB	ST3390N	256K	12ms	3.5"x1"	$399	$529
456MB	ST3550N	256K	12ms	3.5X1"	$529	$639
525MB	ST3600N	256K	10.5ms	3.5X1"	$679	$799
1.05GB	ST11200N	256K	10.5ms	3.5"	$799	$919
1.0GB	**ST31200N**	**256K**	**9ms**	**3.5"x1"**	**$779**	**$889**
1.4GB	ST41651N	256K	15ms	FH	$1099	$1299
1.6GB	ST11950N	1024K	8ms	3.5"	$1599	$1739
1.9GB	ST42100N	256K	12.9ms	FH	$1489	$1689
2.1GB	ST42400N	256K	11ms	FH	$1699	$1899
2.1GB	**ST12400N**	**256K**	**9ms**	**3.5"**	**$1499**	**$1629**
2.1GB	ST12550N	1024K	8ms	3.5"	$1899	$2059
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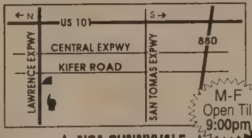

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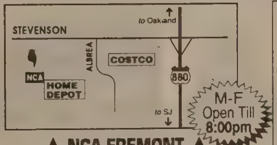

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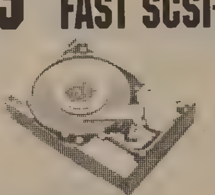

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1.75GB 3.5" FAST SCSI-II

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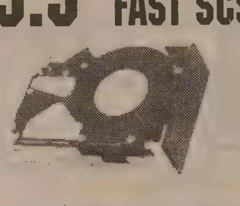
- ▶ 10ms Seek Time
- ▶ 5400RPM
- ▶ 3.5"



$1199

EXTERNAL...$1309

IDE

	MODEL	RPM	SPEED	SIZE	INTERNAL
1.0GB	MC2210A	5400	10ms	3.5"	$829
1.75GB	MC2217A	5400	10ms	3.5"	$1199

SCSI

	MODEL	RPM	SPEED	SIZE	INTERNAL	EXTERNAL
1.0GB	MC2210	5400	10ms	3.5"	$829	$939
1.0GB	MC2210AV	Audio/Video			$999	$1109
1.4GB	MC1908	5400	11ms	FH	$1249	$1449
1.75GB	MC2217	5400	10ms	3.5"	$1199	$1309
1.75GB	MC2217AV	Audio/Video			$1299	$1409
1.8GB	MC1548	3600	14ms	FH	$1499	$1699
2.0GB	MC1926	5400	11ms	FH	$1599	$1799
3.0GB	MC1936	5400	11ms	FH	$2299	$2499

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1.7GB	Microdisk AVLT	3.5"	PC/MAC	10ms	$1699
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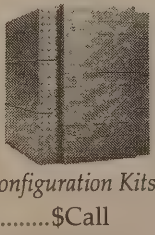

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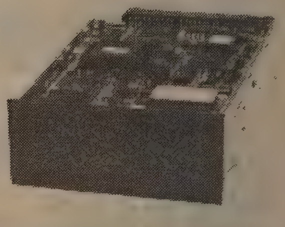

$449

IDE

CAPACITY	M/N	CACHE	SPEED	SIZE	PRICE
240MB	M2637AT	Notebook	11ms	2.5"	$Call
520MB	M2624T	64K	12ms	3.5"	$449

SCSI

CAPACITY	M/N	CACHE	SPEED	SIZE	INTERNAL	EXTERNAL
240MB	M2637SA	Notebook	11ms	3.5"	$359	N/A
1.0GB	M2694ESA	256K	10ms	3.5"	$779	$889
2.0GB	M2654SA	256K	12ms	FH	$1394	$1599

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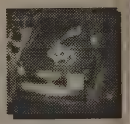
- ▶ Up to 10 Mbytes/s Trans. Rate (synchronous)



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- ▶ 8.9ms Seek Time
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- ▶ 500,000RPM
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- ▶ Up to 10Megabytes/s (synchronous)

EXTERNAL.....$1629

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- ▶ 5400RPM
- ▶ 300,000 MTBF
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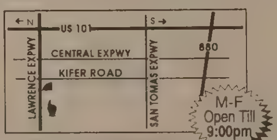

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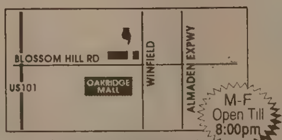

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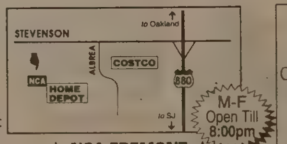

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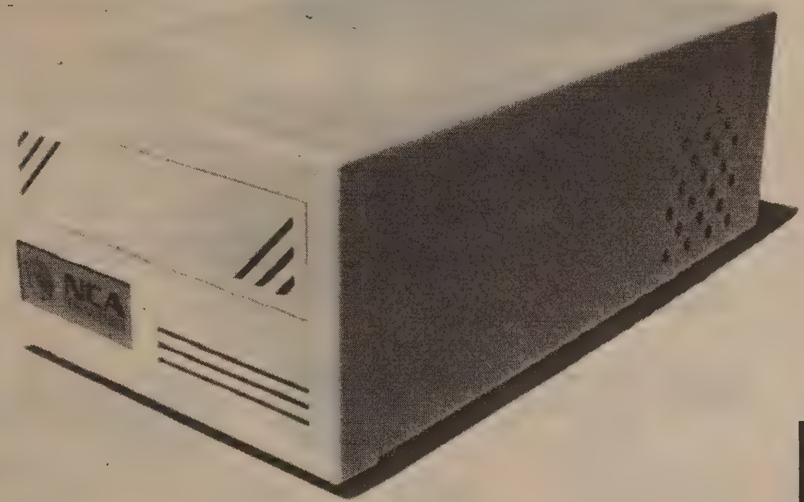

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270MB	Quantum	12ms	2Yr	$379
340MB	Quantum	Fast	2Yr	$409
245Mb	Maxtor	15ms	2Yr	$349
345Mb	Maxtor	15ms	2Yr	$447
456Mb	Seagate	10ms	1Yr	$639
525Mb	Seagate	10ms	1Yr	$799
540Mb	Maxtor	8.5ms	2Yr	$679
540Mb	Conner	12ms	1Yr	$614
1.0Gb	Quantum	Fast	5Yr	$879
1.0Gb	Conner	<10ms	1Yr	$1059
1.0Gb	Micropolis	10ms	5Yr	$869
1.0Gb	IBM	8ms	5Yr	$1159
1.0Gb	Seagate	10ms	5Yr	$889
1.0Gb	HP	10ms	5Yr	$929
1.0Gb	DEC 3107	9ms	5Yr	$1019
1.0Gb	Fujitsu	10ms	5Yr	$889
1.2Gb	Quantum	10ms	5Yr	$1049
1.2Gb	Maxtor	8.5ms	3Yr	$1309
1.6Gb	DEC	9ms	5Yr	$1319
1.7Gb	Micropolis	10ms	5Yr	$1309
2.1Gb	Seagate	9ms	5Yr	$1629
2.1Gb	HP	8.9ms	5Yr	$1629
2.1Gb	DEC	9ms	5Yr	$1749

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SIZE Formatted	Int. Drive	SPEED	WARRANTY	PRICE
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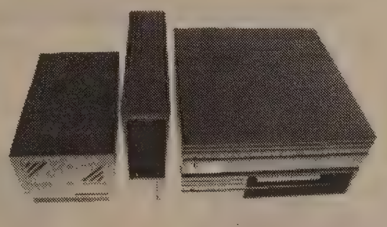
1.4Gb	Seagate	15ms	1Yr	$1299
1.8Gb	Micropolis	14ms	5Yr	$1699
1.9Gb	Seagate	12.9ms	5Yr	$1689
2.1Gb	Seagate	11ms	5Yr	$1899
2.0Gb	Micropolis	11ms	5Yr	$1799
2.0Gb	Fujitsu	12ms	5Yr	$1599
2.0Gb	**DEC**	**12ms**	**5Yr**	**$1379**
3.0Gb	Micropolis	11ms	5Yr	$2499
2.9Gb	Seagate	11ms	5Yr	$2399
2.9Gb	Seagate	Fast Wide	5Yr	$2699
3.5Gb	DEC	11.5ms	5Yr	$2899
4.0Gb	IBM	11ms	5Yr	$3899



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4.0Gb	Archive	4324NT	4mm	$1299
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2.2Gb	Exabyte	EXB8205	8mm	$1649
5.0Gb	Exabyte	EXB8500	8mm	$2649
5.0Gb	Exabyte	EXB8505	8mm	$2559
2.0Gb	HP	35470	4mm	$1099
8.0Gb	HP	35480	4mm	$1199
2.0Gb	WangDat	3100	4mm	$1099
8.0Gb	WangDat	3200	4mm	$1199
8.0Gb	WangDat	3400Dx	4mm	$1249

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NEC	3Xe	190ms	450Kb	$559
CHINON	535	280ms	300Kb	$429
Plextor	5028	265ms	300Kb	$379
PIONEER	602X	300ms	307Kb	$899
PIONEER	604X	300ms	612Kb	$1149
PIONEER	1804	300ms	614Kb	$Call
TEAC	CD-50	265ms	300Kb	$369

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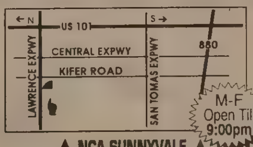

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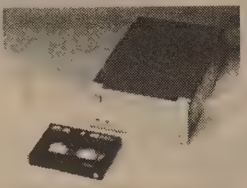

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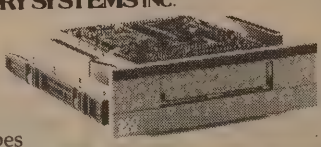

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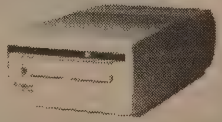

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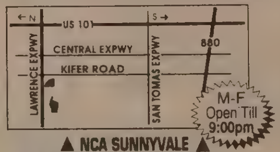

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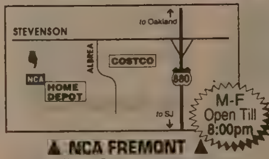

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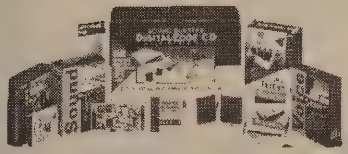

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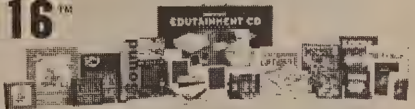

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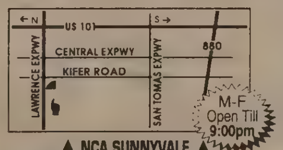

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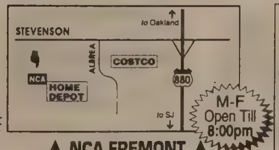

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The ReelMagic CD-ROM Upgrade Kit includes everything listed above, plus a high-performance, MPC Level 2 compliant CD-ROM drive, and a set of two 3.5 watt, 3" shielded computer speakers. Also included are three CD titles form Aris Entertainment: *MPC Wizard, WorldView* and *Video CubeSpace*. And look for the ReelMagic compatible logo on the newest software titles to see if they give you the next generation advantage.

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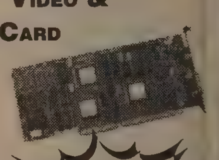

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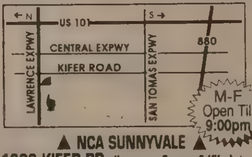
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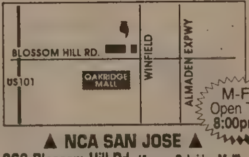
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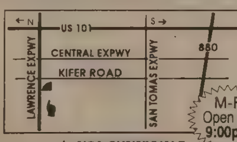

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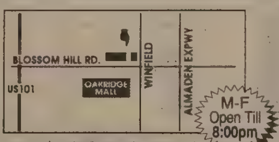

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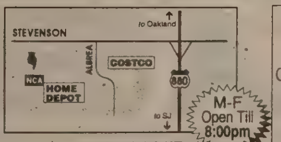

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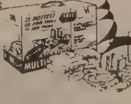

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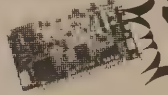

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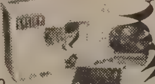

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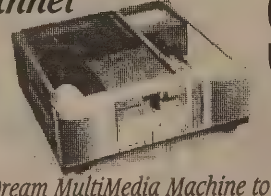

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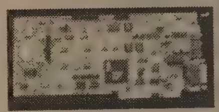

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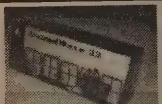

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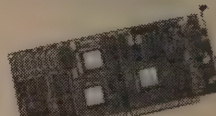

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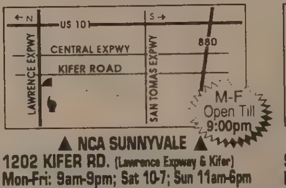

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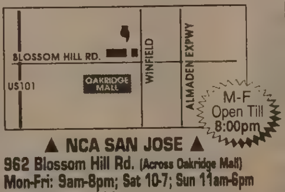

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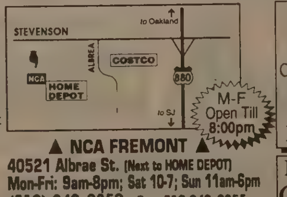

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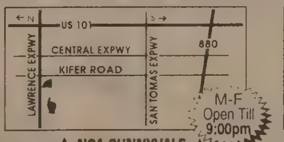

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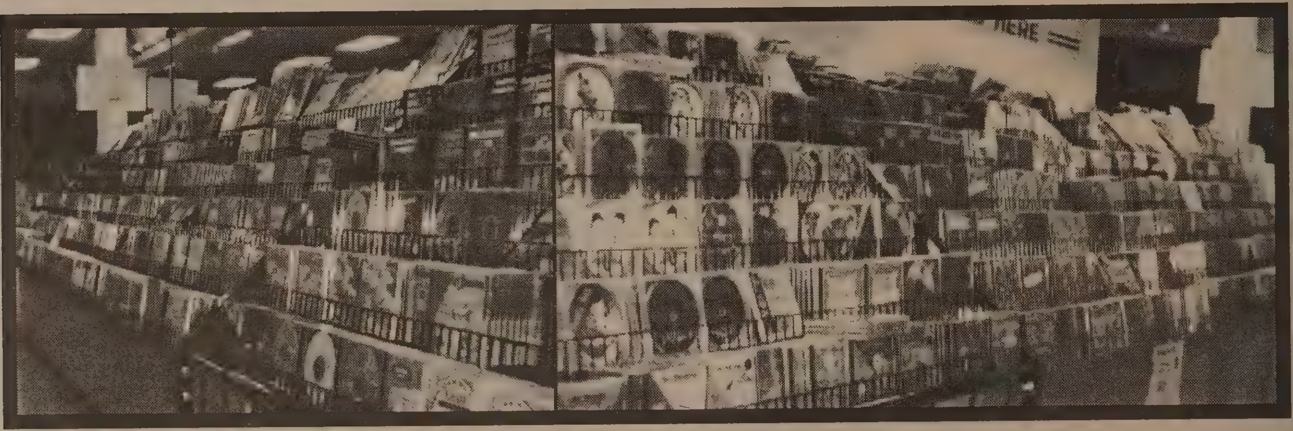

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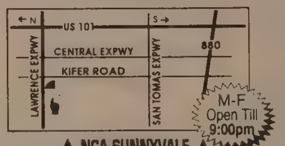

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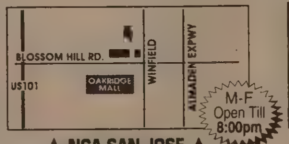

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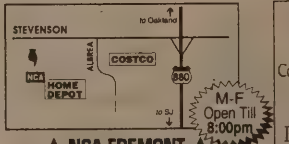

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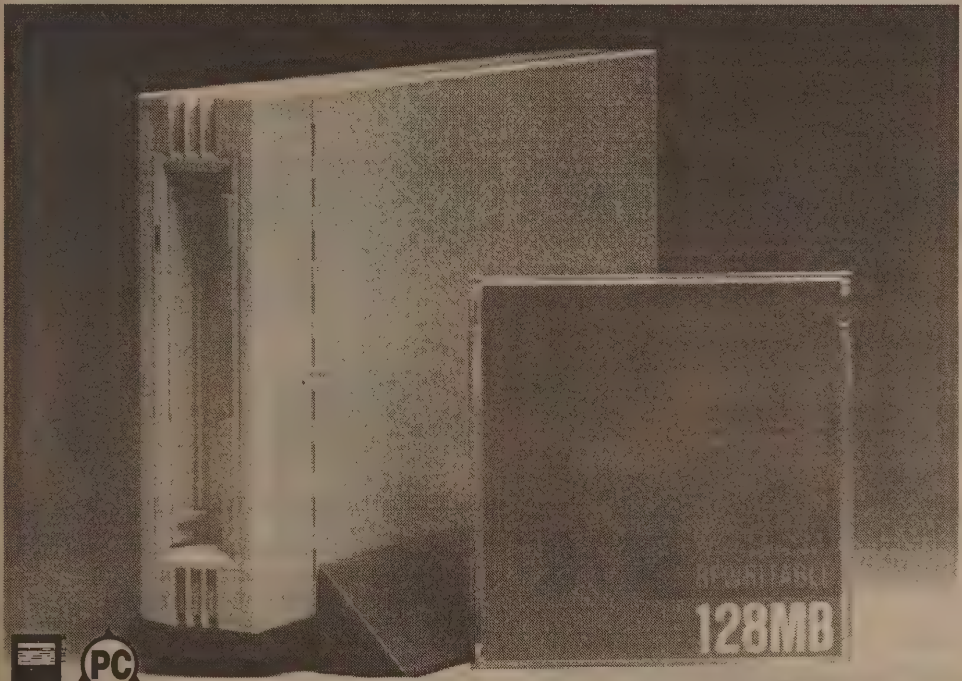
FIVE YEAR 5 WARRANTY

128MB REWRITABLE, REMOVABLE OPTICAL SCSI DRIVES

EXTERNAL SCSI 128MBYTE, 3.5" REWRITABLE OPTICAL

DynaMO™ 128


REWRITABLE
128MB
PC

- External Optical Drive
- Using 2511A Internal
- Includes 1 Cartridge
- Fast 30ms Seek Time
- 3600RPM
- 256K Cache
- Software for MAC (free upon request)

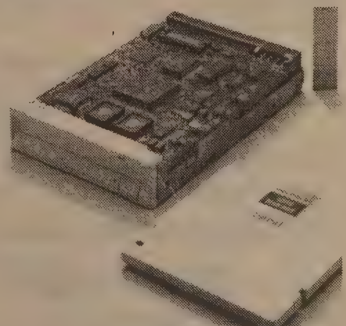
$795*

PC VERSION WITH CONTROLLER.....$899*

INTERNAL 128MBYTE, 3.5" REWRITABLE OPTICAL

- Bare Optical Drive
- 2511A
- Low Profile, only 1"
- Fast 30ms Seek Time
- 3600RPM
- 256K Cache

$769



Cartridge sold separately

*After $75 Manufacturer's Mail-in Rebate
Offer good thru April 30th, 1994

OPTICAL CARTRIDGES

CAPACITY	SINGLE	5-PACK
128MB Fujitsu/Ricoh/Sony	$49	$239
128MB Maxell/Varbatum	$42	$199

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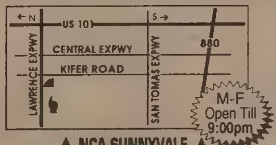
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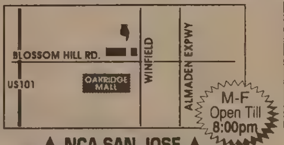
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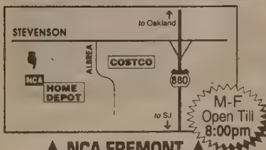
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HEWLETT PACKARD

1.3GB Multifunction Rewritable & WORM Drive

- ▶ HP C1716T
- ▶ SCSI-2 1.3GB

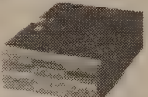
INTERNAL	EXTERNAL C2550 WITH CARTRIDGE
$2399	$2799

1.3GB Cartridge.........................$129

RICOH

128MBYTE, 3.5" SCSI-II REWRITABLE OPTICAL

- ▶ 3000 RPM
- ▶ 256K Cache
- ▶ Approx. 40ms



INTERNAL $719

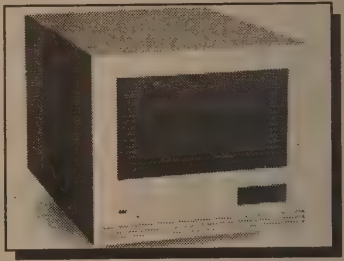
EXTERNAL WITH CARTRIDGE $889

Multifunction Magento-Optical Disk Drive for 1-Gbyte and 650-Mbyte Rewritable and WORM Disk Cartridges, With up to 4-Mbytes Read/Write cache

Maxoptix™

- ▶ Unlimited Data Storage
- ▶ External SCSI Subsystem
- ▶ One year factory warranty.
- ▶ 25-Year life of Glass Media
- ▶ Embedded SCSI/SCSI-2
- ▶ Data Transfer of up to 13.2Mbit/Sec.
- ▶ Ultimate Back-up for NOVELL (Ready-to-Boot Backup)

1GB CART. glass/poly $195



TAHITI IIM - Multifunction
- ▶ 1MB Read/WriteCache
- ▶ External SCSI
- ▶ 35ms

$2389

TAHITI IIM - Multifunction
- ▶ 4MB Read/Write Cache
- ▶ External SCSI
- ▶ 35ms

$2589

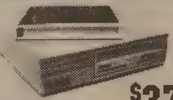
INTRODUCING
TAHITI IIIm
Internal 1.3GB Multi Function Optical

Int. 1MB Cache	Ext. 4MB Cache
$2699	$2899
Int. 1MB Cache	**Ext. 4MB Cache**
$2899	$3099

REMOVABLES

SyQuest

44MB SYQUEST REMOVABLE

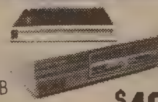


External Drive
- 44MB Cartridge
- Cables
- Installation Software (for MAC)
- PC Software Included With Controller Purchase

$379

Internal Bare Drive $229

88MB C SYQUEST REMOVABLE

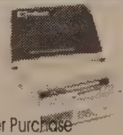


External Drive
- 88MB Cartridge
- Cables
- Reads & Write Both 44 & 88 MB
- Installation Software (for MAC)
- PC Software Included With Controller Purchase

$469

Internal Bare Drive $279

105MB 3.5" SYQUEST REMOVABLE



External SCSI Drive
- 14ms Seek Time
- 105MB Cartridge
- Cables
- Installation Software (for MAC)
- PC Software Included With Controller Purchase

$429

Internal SCSI Bare Drive $279
Internal IDE Bare Drive $239

CAPACITY	SINGLE	5-PACK
44MB Cartridge	$59	$295
88MB Cartridge	$95	$459
105MB Cartridge	$59	$295

BERNOULLI

150MB External SCSI Cartridge Drive

CARTRIDGE INCLUDED

- ▶ Cables
- ▶ One 150MB Cartridge

For MAC or IBM

$479

90MB BERNOULLI REMOVABLE
PC VERSION ......$339 MAC Transportable $3399

BERNOULLI CARTRIDGES	SINGLE	3-PACK
65MB	$59	$169
90MB	$109	$309
105MB	$99	$269
150MB	$109	$309

TEAC

1.44MB 3.5" With bracket add $6.........$37
1.2MB 5.25" $47
1.2/1.44MB Dual Drive........$104

TOSHIBA

2.88MB TOSHIBA Floppy Drive $59.00

FLOPTICALS

IOMEGA®

21MB Floptical Drive

floptical®

MAC Version

INCLUDES:
- ▶ External 3.5" 21MB Floptical
- ▶ One Floptical Media
- ▶ Cables
- ▶ Software for MAC

$399

21MB MEDIA BY IOMEGA LASER ETCHED
SINGLE ......$19.99 5-PACK......$89.99

PC Version

INCLUDES:
- ▶ IOMEGA 21MB 3.5" Floptical
- ▶ One Floptical Media
- ▶ Host adapter SCSI 8-bit
- ▶ Cables
- ▶ Software for PC

INTERNAL	EXTERNAL
$369	$429

21MB MEDIA BY IOMEGA LASER ETCHED
SINGLE ......$19.99 5-PACK......$89.99

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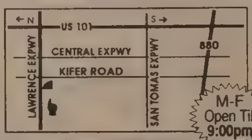

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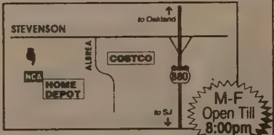

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SCSI CONTROLLERS

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SCSI CONTROLLERS

MODEL	DESCRIPTION	PRICE
1510	CD ROM 16-BIT -SCSI CARD KIT	$99
1522	16-BIT 7HD/2FD KIT	$144
1542CF	BUS MASTER COMPLETE KIT	$238
1542C+	BUS MASTER KIT WITH COREL SCSI	$314
1640	MICROCHANNEL FOR PS/2, 7HD	$319
2742	EISA KIT, 14HDS	$364
2742W	Fast Wide SCSI EISA	$399
2842VL	Fast SCSI-II VESA	$299
APA-460	Slim SCSI PCMCIA SCSI Card	$289

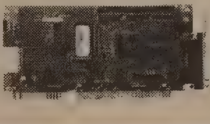
PROMISE TECHNOLOGY,INC.

•While Supplies Last•

SCSI CONTROLLERS

MODEL	DESCRIPTION	PRICE
DC2040	2HD/2FD ISA (0MB, Expdbl to 16MB)	$149

American Megatrends



SCSI CONTROLLERS

DESCRIPTION	PRICE
FastDisk NC EISA non-cache SCSI cont.	$295
FastDisk EISA Caching Controller up to 16MB	$389
FastDisk VLB VESA Local Bus Caching Controller	$393
FastLAN SCSI	$439

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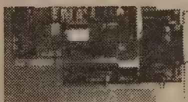


FULL KITS W/DRIVERS FOR CD-ROM/OPTICAL... ETC.

SCSI CONTROLLERS

MODEL	DESCRIPTION	PRICE
T130	**8-BIT, 7HD w/ SCSI works**	**$44**
T228	MICROCHANNEL, 7HD	$139
T338	PARALLEL PORT to SCSI ADAPTER	$109
T348	PARALLEL PORT to SCSI PLUS	$149
T358	Parallel Port to SCSI Plus Enhanced	$199

TRANTOR SCSI Works **$59**
ASPI Device Drivers For:
CD-ROMs, Photo CD, Tape Drives, Syquest, Opticals, Scanners, Hard Drives
TAPEMATE II Back-up software & Music Box-Audio CD Software

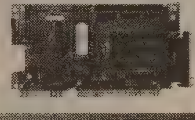
aaa always technology

Easiest to use, PLUG & PLAY with CD Drivers

SCSI CONTROLLERS

MODEL	DESCRIPTION	PRICE
IN2000	16 BIT 7HD/2FD "Easiest to use"	$175
IN2000PRO	With COREL SCSI	$215
AL1000	SCSI To PARALLEL	$159
AL1000PRO	Above With COREL SCSI	$185

FUTURE® DOMAIN



SCSI CONTROLLERS

MODEL	DESCRIPTION	PRICE
TMC850	8-BIT W/BIOS	$59
TMC1670	SVP 16-BIT SCSI VALUE PACK	$149
TMC1680	SVP 16-BIT VALUE PACK 7HD/4FD	$144

Acculogic

SCSI CONTROLLERS

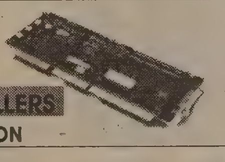
MODEL	DESCRIPTION	PRICE
20	PCI SCSI Host Adapter, Sup. Wide SCSI-3	$229

BUSLOGIC

SCSI CONTROLLERS

MODEL	DESCRIPTION	PRICE
BT545S	ISA Bus Master Fast SCSI Adapter Kit	$208
BT445S	Bus Master Fast SCSI Kit for VL Bus	$274
BT742A	EISA Bus Master SCSI-II Adapter Kit	$329
BT747S	EISA Bus Master Fast SCSI	$364

Q logic™



SCSI CONTROLLERS

MODEL	DESCRIPTION	PRICE
	Fast!SCSI™ EISA	$219
	Fast!SCSI™ ISA	$159
	Fast!SCSI™ VESA Local Bus	$199
	Fast!SCSI™ PCMCIA	$199

UltraStor

SCSI CONTROLLERS

MODEL	DESCRIPTION	PRICE
14F	FD/HD (10MB/SEC)	$195
24F	EISA, 64K, *Fast* (33MB/SEC)	$359
34F	VESA Local Bus Controller	$269

IDE CONTROLLERS

NCA'S STANDARD IDE

IDE CONTROLLERS

MODEL	DESCRIPTION	PRICE
200	2HD/2FD CONTROLLER W/CABLES	$14
211	2HD/2FD W/2 SERIAL, 1PAR, 1GAME	$23
NCL53	SMART CONT. W/BIOS EASY INSTALL	$49
223	**2HD/2FD for VESA LOCAL BUS I/O**	**$59**
15C	CACHING (UP TO 8MB), 2HD, 2FD **UltraStor**	**$159**

BUSLOGIC

IDE CONTROLLERS

MODEL	DESCRIPTION	PRICE
BT510A	IDE Cache Contoller For PC/AT Sys.	$95
BT410A	IDE Cache Controller for VLB	$129

PROMISE TECHNOLOGY,INC.

IDE CONTROLLERS

MODEL	DESCRIPTION	PRICE
DC420VLB	2HD/2FD 512K Cache (exp. -1MB)	$108
DC4030VL-II	4HD/2FD VESA (exp.-16MB)	$124
DC200M	4HD/2FD ISA 512K Cache (exp.-8.5MB)	$129
DC200	4HD/2FD ISA (exp - 16MB)	$94

NCA is your
Controller Super Source

WONDER 16550 IDE CARD

2 IDE DRIVES/2 FLOPPY
2 HIGH SPEED 16550 SERIAL PORTS
1 PARALLEL PORT / 1 GAME
$68

PORT-FOLIO 16550

13-Port Super I/O Card
4 INTEGRATED NS16550 HIGH SPEED UARTs

QUICKPATH

- 2 IDE HD
- 4 Floppy
- 2 Parallel
- 4 Serial
- 1 Game

$129

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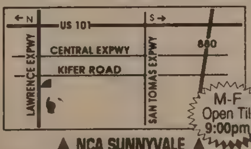

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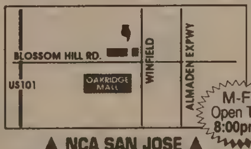

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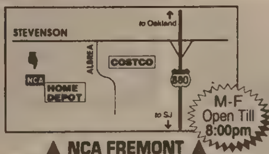

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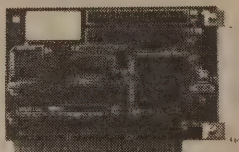
Intelligent Accelerator/IDE Boards

GSI Model 11

8-Bit Four-Floppy & 250MB Tape Accelerator Board

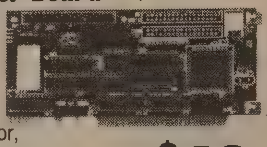


- High-speed floppy interface (up to four floppy drives)
- Doubles the speed of 250MB (QIC-80) tape drives
- Fully supports 2.88MB floppy disk drives
- Supports "Media-Sensing" compatibilites of 2.88MB floppies
- Works in primary or secondary mode
- Perfect floppy or tape upgrade board

$79

GSI Model 18

16- Primary or Secondary IDE Accelerator Board

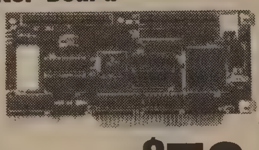


- 16-Bit Accelerated IDE Channel (two IDE devices)
- Increases IDE Data transfer rates up to 80%!
- Compatible with Windows 3.x, OS/2 2.x & DOS
- Supports large IDE drives sizes above 528MB
- Tested and recommended by Micropolis, Fujitsu, Maxtor, Seagate, Western Digital, Quantum and Conner

$49

GSI Model 21

16-Bit IDE, Floppy & 250MB Tape Accelerator Board



- 16-Bit Accelerated IDE Channel (two IDE devices)
- Doubles the speed of 250MB tape drives
- Supports large IDE drives sizes above 528MB
- Increases IDE Data transfer rates up to 80%!
- Compatible with Windows 3.x, OS/2 2.x & DOS
- Novell NetWare Tested & Approved

$59

GSI Model 32 NEW!

16-Bit Multi-Port IDE, Floppy, Tape, & I/O Accelerator Board

- 16-Bit Accelerated IDE Channel (two IDE devices)
- Increases IDE Data transfer rates up to 80%!
- Doubles the speed of 250MB tape drives
- Dual 16550 Serial ports
- Supports up to four Floppies including 2.88MB
- Compatible with Windows 3.x, OS/2 2.x & Novell
- Supports large IDE drives sizes above 528MB
- One Bi-directional Parallel Port

$129

GSI Model 4C NEW!

16-Bit Four-Channel, Eight-IDE Accelerator Board

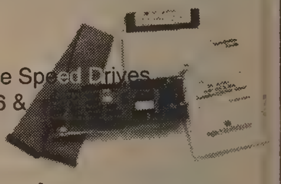
- 16-Bit Multi-Channeling IDE Controller
- Perfect for Nevell mirroring or duplexing
- Four Accelerated IDE channels (Supports 8 IDE Drives)
- Increases IDE data transfer rates up to 80%
- Supports large IDE drives sizes above 528MB

$149

DATA TECHNOLOGY CORPORATION

DTC 3270VL

32-Bit VESA Local Bus *SCSI* Host Controller



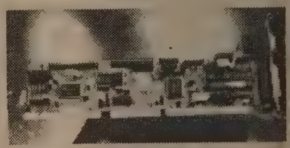
- Supports 7 SCSI Devices (up to 8GB each)
- Supports 2 Floppy Disk Drives
- DOS CD-ROM Driver, Supports Double & Tripple Speed Drives
- DTC ASPI Drivers for: DOS, Novell Netware 386 & Windows NT & OS/2
- Internal SCSI cable
- Complete installation and user documentation
- Corel SCSI Certified

$125

DTC 3280AS ISA to SCSI 16-Bit Host Controller	$104
DTC 3290AS EISA to SCSI 32-Bit Host Controller w/ Cache	$499

DTC 2278VL KIT

32-Bit VESA LOCAL BUS *IDE* Controller with Multi-Function I/O



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- Drivers for MS-DOS, and Novell Netware 386
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DTC 2277VL Kit VESA Local Bus Caching IDE Controller	$149

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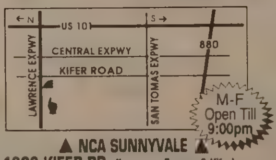

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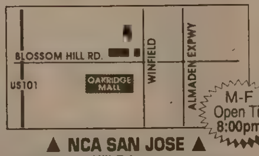

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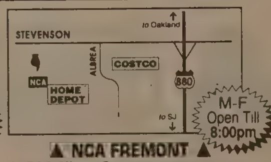

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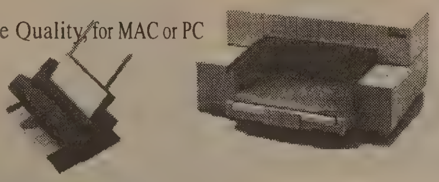

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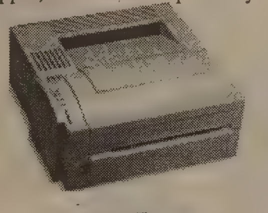

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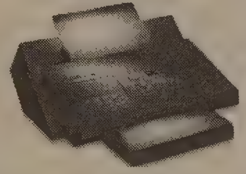

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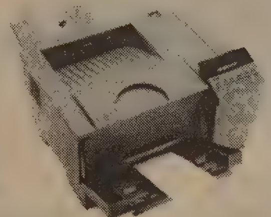

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300dpi laser quality
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Level 2 PostScript
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35 TrueType fonts

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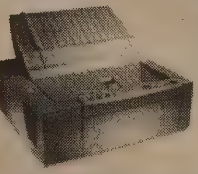

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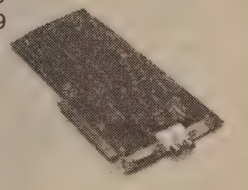

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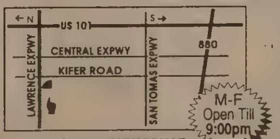

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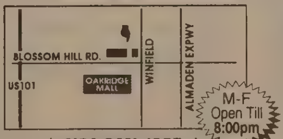

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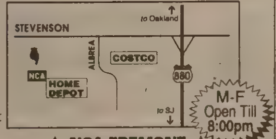

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Tuesday none 10 k 15 laps 62 k
Wednesday full
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A - 30%-.01-1.5
B - 10%-.04-1.0
C - 35%-.05-2.0
D - 5%-.02-1.5
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Multisync 4FGe	15"	.28dpi	1024X768	Flat Screen	X	$629
Multisync 5FGe	17"	.28dpi	1024X768	Flat Screen	X	$999
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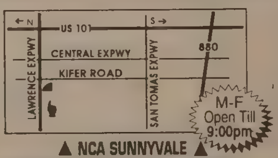
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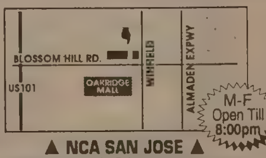
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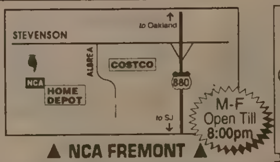
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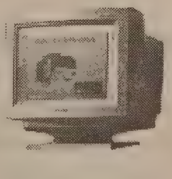

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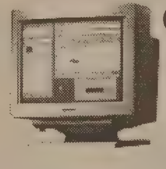

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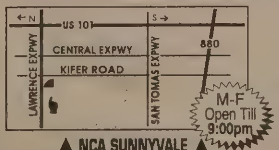

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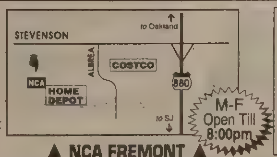

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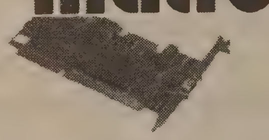

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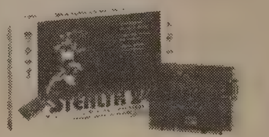

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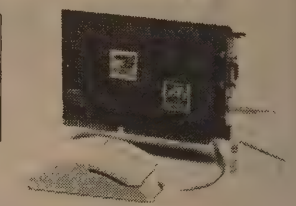

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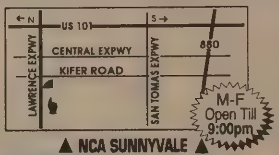

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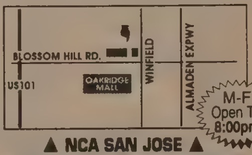

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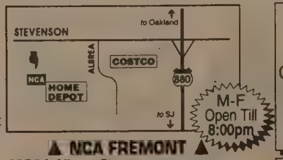

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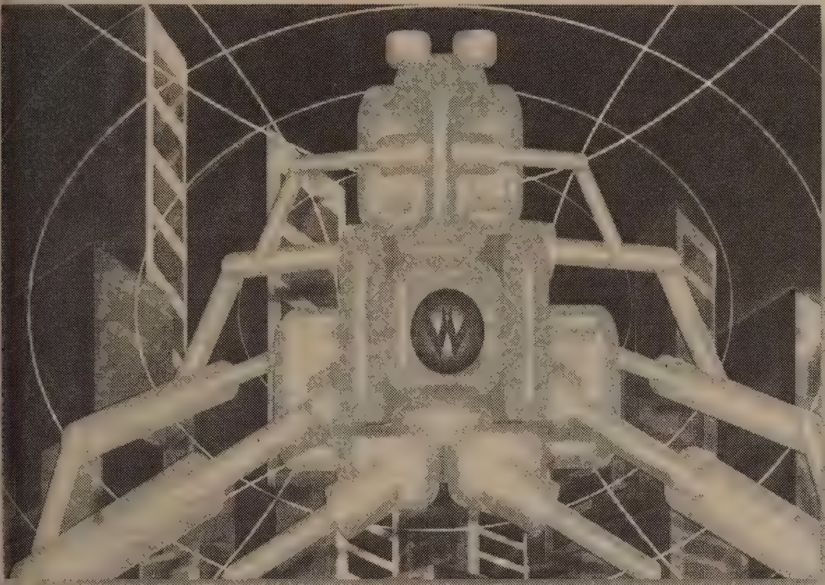

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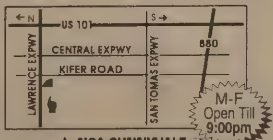
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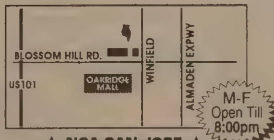
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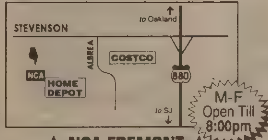
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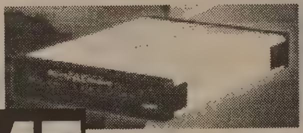

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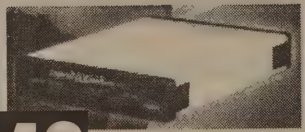

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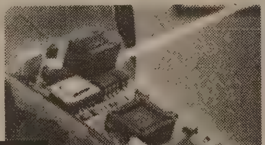

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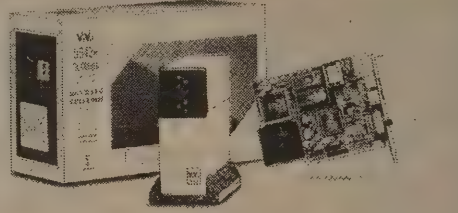

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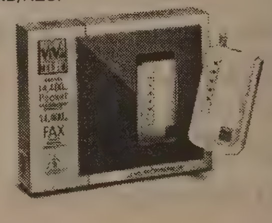

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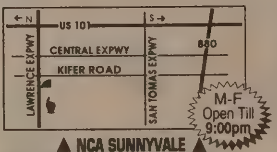

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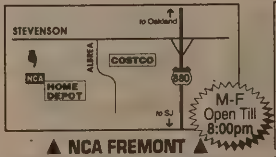

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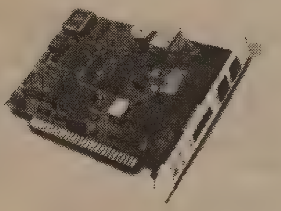

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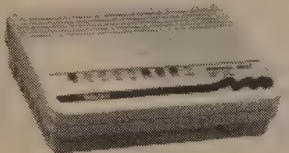

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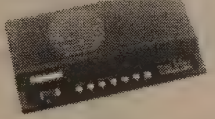

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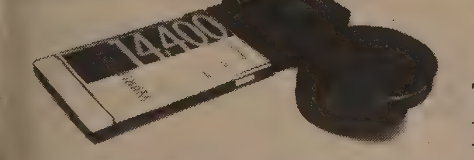

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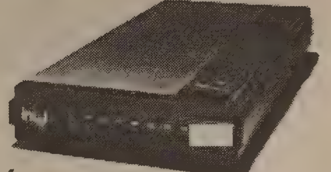

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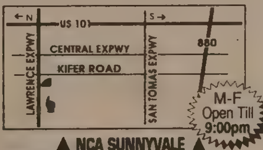
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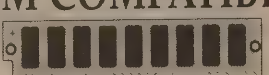

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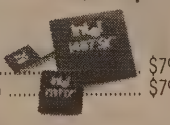

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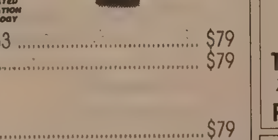

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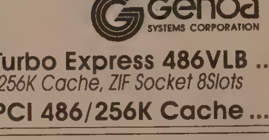

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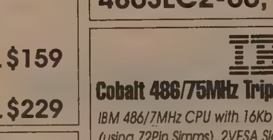

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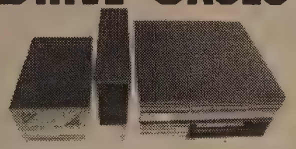

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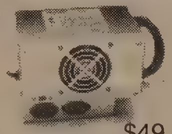

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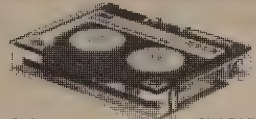

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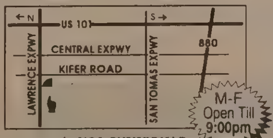

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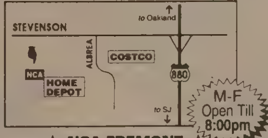

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Continued from page 206

basic, Oxyd is a game of Concentration. However there are brittle walls, dynamite, quicksand, and other hazards to make the game interesting.

Oxyd Magnum is the sequel to a game named Oxyd. I suspect that like some sequels (Lemmings comes to mind) Magnum went overboard in its inclusion of improvements. I cannot confirm this, being unable to locate a copy of the original Oxyd. In any event, the puzzle that stumped me was a checkerboard grid of tiles that reversed the direction of your marble, all surrounded by deadly mines.

The interface for Magnum is fully intuitive, although it sometimes takes experimentation to figure out what various elements do. The graphics are high quality with sixteen colors. The sound effects are of good quality. Overall the game is attractive and fast-paced.

As a puzzle game, I fault Magnum for being too difficult. It is possible that I am simply a klutz. In either event, I recommend you take an opportunity to test the game before deciding to purchase it. (Dongleware Publications, Inc., PO Box 381829, Cambridge, MA 02139-2909. 617/497-1130)

Software Utilities Review

ADOBE ACROBAT FOR DOS/MACINTOSH

Published By: Adobe Systems

System Requirements: DOS Version: 386\486 PC, DOS 3.3 or higher, 3.5" floppy drive and 5MB of free hard disk space, (Exchange requires Windows 3.1, Distiller requires Windows 3.1 and 8MB of RAM, minimum). Macintosh: Mac Plus, SE, Clasic, LC, II or better, System 6.0.5 or greater, 2MB of application RAM (Distiller requires 68020 processor or better with 6MB of RAM).

List Price: Acrobat Reader $50, Exchange $195, Distiller $695

Reviewed By: Lenny Bailes

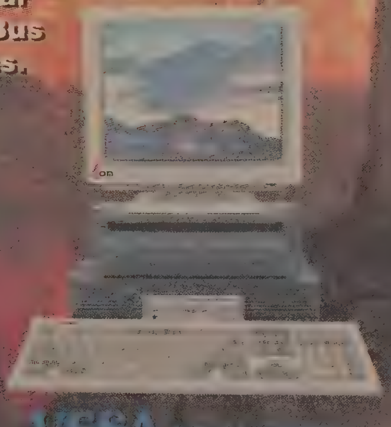
As DOS, Macintosh, and UNIX environments become more and more interconnected, software manufacturers have

Continued on page 240

UNPARALLELED POWER

VESA LOCAL BUS
128K CACHE

ACOM's VESA Local Bus notebook applies an exclusive 32-bit VESA local bus technology which runs your Windows graphics faster than any other notebook. Its built-in 128KB and 8KB burst cache transfer data far faster than conventional DRAM. With this VESA Local Bus notebook, you'll enjoy unparalleled power and success.



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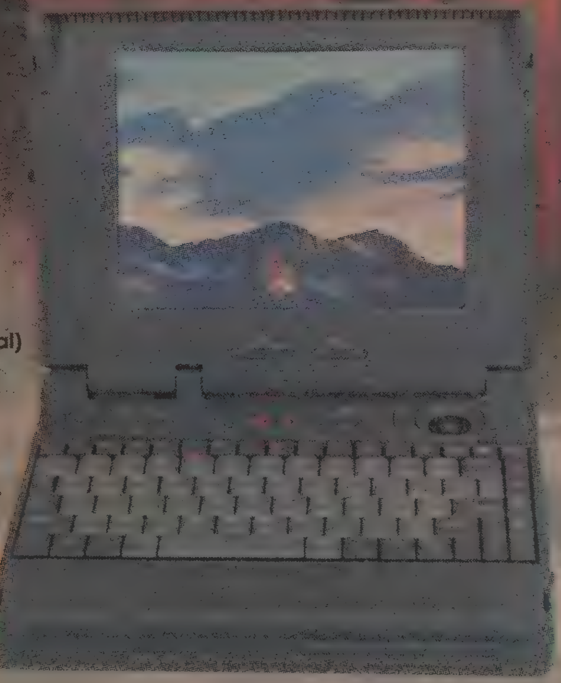

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Intel Premiere/PCI Motherboard
64-Bit Pentium/PCI Architecture
Diamond Viper PCI 84M WinMarks

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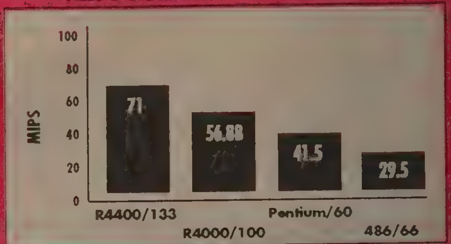
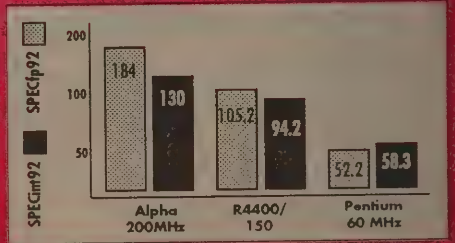


Power Meter benchmarks under Windows NT



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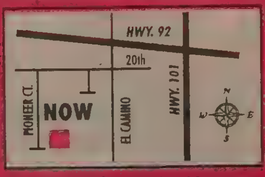

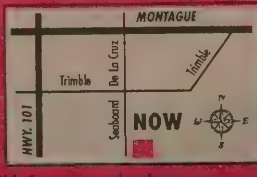

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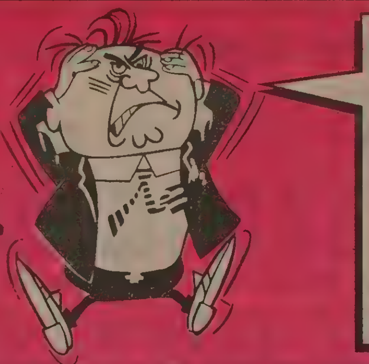

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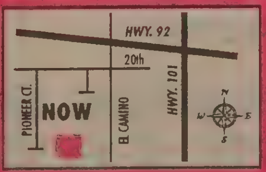

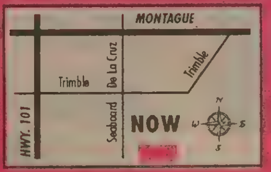

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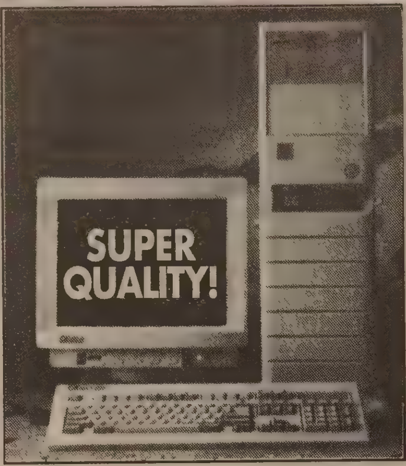

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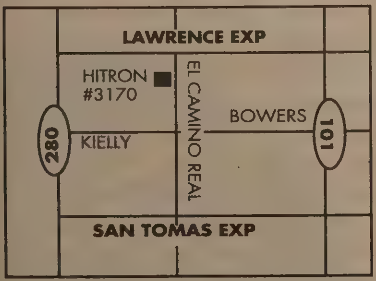

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386DX-40 w/128K CACHE	1445

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PRODUCT SPOTLIGHT

Continued from page 234

begun to recognize the user's desire for a universal file format. Ideally, such a format would allow you to transmit text, graphics, and sound between computing platforms running different operating systems. The document's original appearance would be duplicated on each platform. You could view it, print it, or edit it, then email it back via modem or network.

Adobe Systems, Inc., the inventor of PostScript, has taken a step toward realizing this goal by introducing its proprietary Portable Document Format (PDF). PDF files serve as the container for desktop published documents. The documents may use multiple fonts, imbedded graphics, and hypertext links. The PDF files, themselves, consist only of 7-bit ASCII characters that can be easily transmitted between computing platforms. The complete document is re-created by Adobe Acrobat software written for the appropriate platform.

Acrobat consists of three parts, the Reader, the Exchange utility, and the Distiller (which translates PostScript files to PDF). To read the document on its respective platform, all you need is the Acrobat Reader, which lists for $50, and is available for somewhat less from discount dealers. The PDF format allows the document to retain its original fonts. If those fonts aren't available on the receiving platform, Acrobat Reader creates a simulation, very close to the original in appearance. Acrobat Reader allows you to examine a document from a series of different views. You may set bookmarks to various pages, display the pages as thumbnails, or skip to specific sections of a document by selecting a hypertext button. (The buttons can be added by Acrobat Exchange program, once the document has been converted to the PDF format.

The only drawback to this system is that the Acrobat Exchange (which allows you to create documents) and the Distiller (PostScript translator utility) are both considerably more expensive than the Reader. If you want to send a document around to your friends, they must each also license a separate copy of Acrobat Reader. It is not distributed free. Notwithstanding this, Acrobat is a significant milestone toward the goal of compatibility in personal computing. (Adobe Systems, Inc., 1585 Charleston Rd., Mountain View, CA 94039-2103)

Continued on page 247

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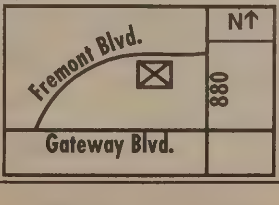

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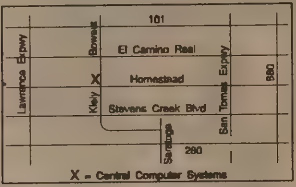

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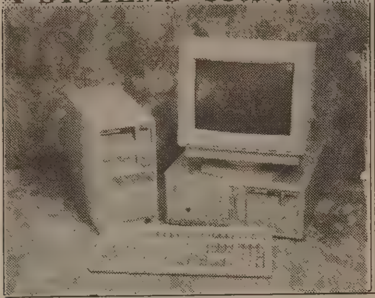

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CDR510 195ms, Triple speed Int	379
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- with controller	199

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- with controller	424
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- 3 half ht or 1 full & 1 half ht for Mac, w.cables	145

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DTC

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INTEL

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Cooling Fan (heat sink)	9

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III 12 x 12, 4 or 16 button	269
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6. DRIVE

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MXT-7345S 345MB 15ms SCSI 1" ht	345
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MXT-540SL 540MB 8.5ms SCSI-2 1" ht	569
MXT-1240S 1.2GB 8.5ms SCSI-2 3.5"	1195
Optical Rewritable 1GB 35ms SCSI, 4MB Ext Tahiti IIM / 1GB Cartridge Glass	2495/195

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LPS-340S 344MB 12ms 128k SCSI	299
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SIIG

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4 Serial, 16 bit, w. 16554, support Com 1-8, IRQ (2,3,4,5,10,11,12,15)	109

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FK9000 129 Key Programmable	59

NORTHGATE OMNI

101NI	69
102	69
Ultra T	95

SIIG

Suntouch 101 Click	49
Suntouch Jr. 84 Key Mini	45

OTHERS

BTC 84 Key Mini	37
Keycat II 101 w. trackball mouse	65
Keytronic 101	37
Maxi 101	35
Maxi Key 124	59
Mitsumi 101	30
PT505C 101	25

9. MEMORY

DRAM

1MB x 1 - 80ns	6.20
64K x 1 - 100ns	1.39
64K x 4 - 80ns	1.65
256K x 1 - 80ns	1.39
256K x 4 - 80ns	5.50

*(price) .... special, while supply last

CENTRAL
COMPUTER SYSTEM INC.
WIDE SELECTION AT LOW PRICES

TEL: 408 241-0185 FAX: 408 241-0390 **820 Kiely Blvd. Santa Clara CA 95051 Page 2 / 5**

SIMM

1MB x 9 - 60ns / 70ns / 80ns (3 chips)	40/39/38
4MB x 9 - 60ns / 70ns	165/160
16MB x 9 - 70ns	779
256K x 9 - 70ns / 80ns	14/13
1MB x 36 - 60ns / 70ns	175/165
4MB x 36 - 60ns / 70ns	679/669
2MB x 36 - 70ns	330
8MB x 36 - 70ns	1280
Simm Mac: 4MB x 8 - 70ns / 80ns	159/155

SIPP

1MB x 9 - 70ns (3 chips)	41

COMPUTER MEMORY (3rd Party)

IBM	
for PS/2 50Z/ 55SX/ 65SX/ 70	
- 2MB / 4MB	95/159
for PS/2 80-111/ 311/ 121/ 321 - 4MB	225
for PS/2 80-A21/ A31/ A6 - 4MB	279
Compaq	
for Deskpro 386N/ 386SX20	
- 2MB / 4MB / 8MB	109/159/319
for Deskpro 386-20e/ 20/ 25e	
- 1MB / 4MB	95/185
for Deskpro 486M	
- 2MB / 4MB / 8MB	109/175/409
for LTE 286 - 2MB / 4MB	129/195
for LTE 386S-20 - 4MB	209
for SLT 286 - 1MB / 4MB	99/259
for Prolinea 386-25ZS/ 25S	
- 2MB / 8MB	105/409
for ProLinea 486-33/ 50/ 25S	
- 4MB / 16MB	175/639

KINGSTON MEMORY

current price	call

LAPTOP / NOTEBOOK (3rd Party)

AST for Exec - 4MB	155
Compaq	
for Contura - 4MB / 8MB	220/399
for LTE-Lite 20/ 25/ 25C	
- 4MB / 8MB	215/349
IBM	
for L40SX/ N33SX - 4MB / 8MB	199/399
MAC	
for Powerbook 140/ 170	
- 2MB / 4MB	135/179
NEC	
for Ultralite III-SL25C/ SX20	
- 4MB / 8MB	239/419
Packard Bell	
for 386SX - 2MB / 4MB	155/259
Panasonic	
for 170/ 270/ 370 - 1MB	99
Toshiba	
for T1600 - 2MB	139
for T2200SX - 2MB / 4MB / 8MB	119/239/299
for T3100SX - 2MB / 4MB	129/209
for T3200 - 3MB	209
for T3200SX - 2MB / 4MB	129/199
for T3400 - 4MB / 8MB	239/449
for T5100 - 2MB	139
for T5200/ T8500- 2MB / 8MB	129/420
for T6400 DX / SX / SXC - 4MB / 8MB	220/379

LASER PRINTER MEMORY UPGRADE

JET RAM (3rd party) :	
Epson	
for EPL6000 - 2MB / 4MB	114/175
HP	
for Desk Jet 500/500C - 256k	75
for Laser Fax - 1MB	80
for Laser Jet II/ IID	
-1MB / 2MB / 4MB	99/145/235
for Laser Jet III/ IIIP/ IIID	
- 1MB / 2MB / 3MB / 4MB	79/125/169/215
for Laser Jet 4/ 4M	
- 4MB / 8MB	199/389
Panasonic	
for KX-P4410/ 4430	
- 1MB / 2MB / 4MB	95/139/229
for KX-P4420/ 4450i	
- 1MB / 2MB / 4MB	99/145/235
for KX-P4450 - 1MB	139
for KX-P4455 - 2MB	169
for KX-P4400/ 5400 - 2MB	185
QMS	
for PS410	
- 1MB / 2MB / 4MB	99/145/235
for PS815/ 825	
- 2MB / 4MB	159/249
Texas Instruments	
for Micro Writer - 1MB	69
for Micro Laser Turbo XL - 1MB	69
PACIFIC DATA :	
Pacific 4 for HP IIP+/ IIIP/ III/ IIID	
- 1MB / 2MB / 4MB	89/135/225
1-2-4 Plus for HP II/ IID	
- 1MB / 2MB / 4MB	115/159/249
Pacific 4 SIMM for HP 4/ IIISI/ XL300	
- 4MB / 8MB	189/375
for ProTracer - 5MB / 8MB	365/515

10. MODEM & FAX

BOCA

14.4 Fax modem Int / Ext	125/155
14.4 Pocket Fax modem	169

GVC

14.4 Fax modem Int / Ext	129/149
PCMCIA 9624 Fax	139
PCMCIA 144 Fax	245

HAYES

Accura 2400 Int / Ext	65/75
Accura 96 + Fax Int / Ext	165/179
Accura 144 + Fax Int / Ext	175/189
ESP Communication Single Serial	85
ESP Communication Dual Port	125
Optima 144/144 Fax modem Ext	389
Optima 288 V.Fast 144 Fax	435
PCMCIA Optima 144 Fax	325
Pocket Edition 2400 w. Smartcom EZ	129
SmartCom for Windows	47
V-Series Smartmodem 9600 v.42, MNP5 Ext	499

INTEL

Faxability Software	*(25)
Faxability Plus/OCR for Windows 2.0	*(75)85
New Fax modem 24/96 Int	55
New Fax modem 96 Int / Ext	139/159
New Fax modem 144 Int / Ext	149/169
PCMCIA 144 Fax modem	*(295)315
SatisFAXtion modem w. Faxability software	
- 400 144/144 v.42, v.32bis, MNP5 Int	269
- 400e 96/144 4k data buffer Ext	*(299)325

MEGAHERTZ

PCMCIA 96/24 Fax modem w. X-Jack	225
PCMCIA 144 Fax modem / w. X-Jack	315/325
P2144 Pocket 144/144	255

MICROCOM

Deskporte ES 28.8 Fast 14.4 Fax	255
Microporte 4232bis Fax modem	465
QX 4232bis / QX4232bis + modem	455/565

PRACTICAL PERIPHERALS

Fax Me (turn HP laser to fax receiving)	119
Mini Tower 144FX144 Ext	185
PM144FX144 Int	165
Pocket 144 Fax modem	299
PM2400 Fax modem	89

SHIVA

Net modem/E Ethernet BNC/TP	1475

SIIG

TeleCommunicator 10-in-1 Fax modem	229

US ROBOTICS

Courier 16.8 Int / w. Fax	459/499
Courier 16.8 Ext / w. Fax	495/545
Courier v32 Terbo Fax 19.2MB w. ASL	*(425)
Sportster 144/144 Fax MNP5 Int / Ext	145/165
Sportster 144/144 for Mac Ext	189

ZOOM (7 yrs. warranty fr. Zoom)

AFC Int / AFX Ext	55/69
96/24 w. WinFax Lite Int / Ext	75/79
96/96 w. WinFax Lite Int / Ext	135/155
144/144 w. WinFax Lite Int / Ext	145/165
144/144 Fax Modem & Voice Int / Ext	175/195
28.8 V. Fast Int	225

ZY-XEL

U1496B 16.8 voice 14.4 Fax w. Win s/w Int	299
U1496+ upgradable to 19.2Kbps Int	415
U1496E 16.8 voice 14.4 Fax, LED Ext	309
U1496E+ upgradable to 19.2Kbps Ext	419
U1496P Portable 16.8 / 14.4 Fax 2 line	399

OTHERS

ASAP TF-333 Phone & Fax Auto Switching	89
National Semi TyIN 2000 Answer/Fax	99
Winport (modem & fax sharing software)	195
Zoltrix 96/24 Fax modem v.42, MNP5 Int	79

12. MONITOR

EMC

EM1412 14" Mono Amber, 90-260v	95
EM1417 14" 1024 x 768 VGA Mono Paper White	119
EM1428 14" 1024 x768 .28, 90-260v	245
EM1430K 14" 1024 x 768 .28, NI	265
EM1439G 14" 1024 x 768 .39	209

MAG (auto switch power)

MX15F MPRII 15" Flat 1280 x 1024 .28, NI	495
MX17FG 17" Flat 1280 x 1024 .26, NI	899
Mac Adapter	25

MITSUBISHI

HL6955SETK 20" 1280 x 1024 .31, NI	1745
TFS6705 Diamond Pro 17" 1280 x 1024 .26, NI, Tinitron, MacII, 100-240V	1045
BNC Cable	39

NANAO (call for rebate info.)

F340iW 15" Flat Screen 1024 x 768 .28	545
F550iW 17" 1280x1024 .28, NI / w.rebate	1065/1035
F560iW 17" 1280x1024 .26, NI / w.rebate	1295/1265
F550i 17" 1280 x 1024 .28, NI / w.rebate	945/845
T560i 17" 1280 x 1024 .25, NI / w.rebate	1635/1585
T660i 20" 1280x1024 .31, Trin./ w.rebate	2395/2295
F760iW 21" 1280x1024 .31, NI / w.rebate	2075/2065
F780iW 21" 1600 x 1280 .26, NI	3195

NEC (120V)

SVGA 14" 1024 / 768 .28	335
3FGe 15" 1024 x 768 .28, Mac	569
3V 15" 1024 x 768 / w. rebate	479/429
4FGe 15" Flat 1024 x 768 .28, NI, Mac	625
5FGe 17" 1024x768 .28, NI / w. Lens	995/1075
5FGp 17" 1280 x 1024	1129
6FGp 21" 1280 x 1024	1995
NEC Monitor Lens : Anti-reflection, Anti-satic for 4FG / 5FG / 6FG	*(59)/*(99)/185
FG/MacII Cable Adapter Kit	14.50

NOKIA

449E 15" 1280 x 1024 .28 NI	515
447B 17" 1280 x 1024 .25	965
445X 21" 1600 x 1280 .26	2499

PROTON

PM1561A 15" 1280 x 1024 w. speakers built-in	399

SEIKO (90-132V)

CM2050 20" 1024 x 768 .31, NI, Mac	1395

SIIG

9" VGA Mono Paper White 640 x 480	135

SONY

1430S 14" 1024 x 768 .25, NI, 120V	529
17SE 17" 1600 x 1280 .25	1145
1730 17" 1024 x 768 .25, NI	995
2038 20" 1280 x 1024 .30, NI	2185

STANDARD TECHNOLOGIES

400-M 14" VGA Paper White	119
428-VESA 14" 1280 x 1024 .28, NI	279

VIEWSONIC

4e 14" 1024 x 768 .28, 110/220V	279
5+ 14" 1024 x 768 .25, NI, MacII	475
6e 14" 1024 x 768 .28, NI	295
14e 14" 1024 x 768 .28, NI, MPRII	349
15 15" 1280 x 1024 .28, NI, MacII	449
17 17" 1600 x 1280 .27, NI, MacII	975
17G 17" 1280 x 1024 .28, NI	825
20 20" 1600 x 1280 .28, NI, MacII	1575
21 21" 1600 x 1280 .26, NI, MacII	1825
Mac Cable Adapter	35

OTHERS

Monitor Power Saver	39
Telepower	49

13. MOTHERBOARD

AIR (w/o cpu)

486-33 / DX2-66 256k, 3VLB slots	215
486-33 / DX2-66 256k EISA, 3VLB slots	425
486SH - 33 / DX2-66 256k, Green PC	175
Pentium 256k ISA VLB, IDE I/O built-in	535
PCI 586 256k EISA, Fast-wide SCSI built-in.	735

AMI

Super Voyager II 486-33 256k VLB, 7 slots	645
Super Voyager II 486-DX2-66 VLB, 7 slots	865
Enterprise III 486-33 256k EISA VLB	875
Enterprise III 486-DX2-66 EISA VLB	1095
Enterprise IV 486-33 256k EISA VLB	769
Enterprise IV 486-DX2-66 256k EISA VLB	999

ALARIS (IBM)

486SLC2-66 64k VLB w. CPU & Math Proc..	319

DIAMOND

486-DX Fast Bus VLB	185

IBM

486SLC-33 / 66 16k Internal cache ISA v.2 w. CPU & Math Processor	265

LYNX (USA made)

486-33 / 50 / DX2-66 256k VLB	149

MICRONICS

386-33 64k Gemini, 32MB max	245
BCP 386-33 64k, 4MB max w/o cpu	95
- w. CPU	145
486-33 256k VLB	575
486-DX2-66 256k VLB	765
JX30 486-DX2-66 256k VLB w. Zif socket	859
486-33 256k EISA VLB	830
486-DX2-66 256k EISA E2	945
486-DX2-66 256k EISA VLB	1020
PCI 586-60 256k, ISA 3PCI slots	1395

NICE (w/o cpu)

486-33 / DX2-66 256k VLB	199
486-50 / DX2-66 256k Mini EISA VLB	259
486-50 / DX2-66 256k EISA VLB	399

SUPER P5VESA

Pentium VL 586-60 256k / w. Flash Bios.	495/535

QUICKPATH

486-50 64k 15ns ISA, w/o cpu	175

OTHERS

386-40 128k w. CPU / w/o cpu	159/109
486-33 128k ISA w/o cpu	125
486-33 256k ISA w/o cpu	139

14. MOUSE & JOYSTICK

AGILER

ATB-610 Serial Trackball	24.50
Master Plus 400	19.50

ANCER (black)

3-button	22

APPOINT (portable)

MousePen Pro	49
Thumbelina	49

KENSINGTON

Bus 4.0	119
Expert Serial & Trackball 4.0	99

LOGITECH

C14 Serial (2-button) oem	19
Cordless II	85
Cyberman 3D Controller	69
Dexxa Serial	19.50
First Serial oem / reg.	25/31
Fotoman Plus Camera for PC & PS/2	519
Mouseman Bus oem / reg.	49/64
Mouseman Serial oem / reg.	41/50
Trackman Portable	69
Trackman II	75

MICROSOFT

Ball Point Portable	119
Bus 2.0 (oem) / w. Bus Card	46/69
Bus 2.0 w. Expansion Card	89
Mouse 2.0 + Windows 3.1	149
Original Serial Mouse	29
Serial 2.0 (oem)	45
Serial 2.0 w. PS/2 Port	*(65)
Serial 2.0 w. 9 to 25 pin Adapter	*(59)

MOUSE SYSTEMS

Little Mouse PC Serial (2-button optical)	29
New Point (trackball for laptop & PC)	39
Omni (2-button, MS compatible)	19
PC Mouse (3-button optical)	*(45)
PC Trackball II	49
Serial Bus Card (9IRQs)	29
The New Mouse 400dpi (3-button)	39

JOYSTICK :

THRUSTMASTER

ACM Gamecard	29
Flight Control System / Pro	68/114
Flight Stand Holder	19
Formula TI	129
Rudder Control	115
Weapon Control MKII	*(99)

OTHERS

Adapter Kit / Analog Pro	16.50/35
Gravis Game Pad	23
Warrior 5, Quick Shot	14.50

15. NETWORK

3COM

3C503 8 bit coax / TP	179/*(159)
3C503 Etherlink II 16 bit coax / TP	169/179
3C507 16 bit Ethernet coax / TP	289/299
3C509 Etherlink III coax / 5 pack	125/555
3C509 Etherlink III TP / 5 pack	122/545
3C509 Combo / 5 pack	145/595
3C529 Etherlink III for MCA / TP	245/249
3C579 Etherlink III EISA coax / TP	235/239
3C589 PCMCIA TP / Combo	255/299
3C16270 Link Builder TP, 12 Port HUB	395
TokenLink III 16/4 ISA / MCA / EISA	435/495/645

ADDTRON (Novell compatible)

AE-200JL Jumperless BNC & TP	65
AE-200LB 8 or 16 bit BNC only	55
AE-200LC 8 or 16 bit BNC & TP	59
AE-200LT 8 or 16 bit TP only	55
Arcnet: Arc120TP 8 bit Combo	59
Arcnet: Arc220TP 16 bit Combo	69
Arcnet: 8 Port Active HUB coax / TP	135/145
ET-200STS NE2000 coax compatitble	65
Boot PROM 16 bit	15
HUB: UTP8 (8TP + 1BNC)	199
HUB: UTP16 (16TP + 1BNC + 1AUI)	435
Pocket Adapter: BNC / TP	125/129
Transceivers: ET10TB (TP<-->AUI)	45
Transceivers: ET10CB (BNC<--> AUI)	45

ALLIED TELESIS (CentreCOM)

AT-1500T / AT1700T (TP)	79/79
AT-1500BT / AT-1700BT (BNC + TP)	99/99
Transceivers: MX10 / 210T	45/45

ARTISOFT (Lantastic)

AE-2 Ethernet Adapter	195
AE-2 Ethernet Starter Kit 5.0 Dos / Win	449/509
AE-3 Ethernet Adapter	*(209)
AE-2/T 16 bit 10BaseT Adapter	199

(price) .... special, while supply last

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AI Software 5.0 Win / 6 pk / 12 pk	85/450/795
2Mbps 1-user Kit Dos / for MCA	139/215
Central Station II	399
Ethernet s/w Kit 5.0 w. cable Dos / Win	79/139
Lantastic Z 5.0 (2 stations)	*(69)89
Lantastic for Netware v4.0 / v5.0	99/275
Lantastic for TCP/IP single / 5-user	185/760
NR2000A Combo	225
NR2000C BNC only / 6-pk	172/975
NR2000C Starter Kit Win	*(429)
NR2000T RJ45 only single / 6 pk	175/979
NR2000 MCA	255
NR-SI 2000C / 2000T	*(85)/*(95)
NR-SI 2000C AI Starter Kit	315
NR-SI 2000A Combo	129
NR-SI 2000M for MCA	165
Peer-HUB 10BaseT Concentrator	270
Remote Boot ROM for AE-2, AE-3, NR2000	45
Simply Lantastic Starter Kit	215
Simply Lantastic Add On Kit	109
Simply Lantastic Software Kit	59
Sounding Board Adapter Kit	69
T-Runner 8 Port HUB	320
T-Runner 12 Port HUB	520

ASANTE

AH1012 Intelligent HUB 12 Port	875
10T HUB 8 Port / 12 Port	255/495
FriendlyNet with AUI / BNC / TP	69

CASTELLE

JetPress (network print server) for HP II, IID, III, IIID, coax / TP	429
LANPress (print server connects up to 4 printers)	
- Ethernet Thick/Thin coax (1P 3S)	475
- Ethernet Thick/Thin coax (2P 2S)	625
- Ethernet 10BaseT (1P 3S)	475
- Ethernet 10BaseT (2S 2P)	635

CC:MAIL

cc:Mail Dos Platform 4.0	199
cc:Mail Win Platform 2.0	345
cc:Mail 10-user pk / 25-user pk	249/579
cc:Mail Fax 1.2	1350
cc:Mail Gateway 3.21	859
cc:Mail Remote	199
cc:Mail Router 4.0	875

DCA

Crosstalk 2.0	119
Commuicator	58
IRMA Workstation Dos / Win	225/359
IRMA 3270 for MacII/ LC/ SE	695

D-LINK

DE-205 TP : 4 Port HUB + 16 bit Card	295
DE-220 TP 8 or 16 bit	*(69)
DE-600 Pocket Adapter coax / TP	215/215
DE-650 PCMCIA coax / TP	195/199

FARALLON

PN381 PhoneNet w. Timbuktu for Win	259

GATEWAY COMMUNICATION

G/Ethernet 16 coax / 32 bit	59/*(199)

IBM

Ether 16 coax / TP / Combo	89/85/95
PCMCIA for Token Ring 16/4	479
PCMCIA 10B2 / 10BT	215/195

INTEL

EtherExpress Flash LAN Combo / 5 pk	135/625
EtherExpress 16 coax / 5 pk	112/485
EtherExpress 16 Flash coax	122
EtherExpress 16 TP / 5 pk	109/*(465)
EtherExpress 16 TP Flash / 5 pk	125/565
EtherExpress 16 MCA / 16 MCA TP	175/185
EtherExpress 32 EISA	439
Flash 32 EISA	249
HUB: 12 Port EtherExpress ISA / EISA	565/645
LAN Protect 1.5 (virus protection)	685
LAN Sight Support 4.0	345
LAN Spool s/w 386 NLM v3.5A	425
Netport II Thin & Thick / 10BT	395/399
Netport Express XL	465
NetSatisfaxtion v2.5 for Novell	955
TokenExpress 16/4 ISA/ EISA/ MCA	435/655/475

LANPRO

2000JC 16 bit coax (BNC only)	49
2000JT 16 bit TP with cable	49
2000JA 16 bit Combo	55
2000A 3-in-1	59
HUB ER5390 : 8 Port (8TP + 1BNC)	185
HUB ER5396 : 16 Port (16TP + 2BNC)	355

NOVELL

Dos 7 (includes Personal Netware)	75
EPROM for NE2000	35
EP2000 coax / TP	99/89
Microdyne NE2000 coax / 5 pk	99/445
Microdyne NE2000 Combo / 5 pk	125/515
Microdyne NE3200 EISA coax	*(295)
NE2000 Plus Ethernet coax / 5 pk	109/495
NE2000T Plus Ethernet TP / 5 pk	105/435
NE2000 Plus Combo / 5 pk	135/550
NE3200 Eagle EISA w. TPA	*(475)545
NE3210 EISA 32 bit Combo (ws)	215
Netware Lite 1.1 + DR Dos 6.0	*(55)
Netware 3.12	
- 5 / 10 / 25-user	615/1395/2085
- 50 / 100 / 250-user	2695/3995/6995
Netware 4.01	
- 5 / 10 / 25-user	825/1795/2625
- 50 / 100 / 250-user	3595/5495/9695
NPE 400 Print Server	350
NTR 2000 Token Ring	435
Personal Netware w. Net Wars (3D game)	75

SMC (Western Digital)

8003 Plus Elite 8 bit coax	99
8013 Plus Elite 16 coax / 6 pk	125/625
8013 Plus Elite 16 TP / 6 pk	127/629
8013 Plus Elite 16 Combo / 6 pk	149/775
8013 Plus/A for MCA / TP	195/199
8033 Elite 32 coax / TP	595/599
8 Port Concentrator (8TP + 1AUI)	349
12 Port Concentrator (12TP+2AUI+1BNC)	595
Elite Ultra 16 coax / 6 pk	110/595
Elite Ultra 16 TP / 6 pk	112/*(445)
Elite Ultra 16 Combo / 6 pk	129/695
Netware Boot ROM for Ethernet	34
Token Ring 16/4 ISA / MCA	279

SYNOTICS

Network products	call

XIRCOM

PCMCIA CE-10B2 BNC / CE-10BT	275/279
PCMCAI CE-10BC Combo	315
PE3-10B2 Pocket Adapter coax	285
PE3-10BT Pocket Adapter TP	289
PE3-10BC Pocket Adapter Combo	325

OTHERS

Mailman 2.0 (10-user for Novell netware)	*(99)

CABLES & ACCESSORIES

10BaseT, Level 3 plenum 1000'	165
Belden 8259, RG58 1000'	165
RG58 500' / 1000'	65/109
Twisted Pair 4-pair, PVC, Level 3	
- 1000' / 500' / 200'	89/55/35

16. POWER SUPPLY

AMERICAN POWER CONVERISON

APC-400 Smart-UPS (286, 386 WS)	289
APC-600 Smart-UPS (386, 486 FS)	359
APC-900 Smart-UPS (386, 486, FS & WS)	569
APC-1250 Smart-UPS (multiple FS & WS)	699
APC-400 Back-UPS (300W)	179
APC-450 Back-UPS (325W)	215
APC-600 Back-UPS (425W)	285
APC-900 Back-UPS (650W)	375
APC PowerChute Plus :	
- for Novell	65
- for OS/2, Lan Server, 3 Com	75
- for UNIX / XENIX	99
- for Windows NT	69
Power Doctor (DOS) I/F Kit for Smart-UPS	79
Surge Arrest Unit	call

GENERAL

250W for Baby AT / Baby or Mid Tower	45/45
250W for AT / Full Tower	47/49
300W for Full Tower	69
550W for UPS	279
1200W for UPS	659

PC POWER COOLING

Standard 220 for Desktop / Full Tower	85/85
Silencer 270	
- for Slim (baby or mid tower)	149
- for AT Desktop / Full Tower	165/165
Turbo Cool 300	
- for Slim (baby or mid tower)	149
- for Desktop / Full Tower	175/175
Turbo Cool 450	
- for Desktop / Full Tower	325/325

TRIPP LITE

Isobar 4	39.95
Isobar 6	47.95
Isobar Console CC16 Plus w. RJ11	75
Isotel 4 w. RJ11	49.95
Isotel Ultra 6 w. RJ11	55.95
UPS Monitoring Board for Netware	59

17. PRINTER

BROTHER

HJ-400 Desktop Ink Jet for PC or Mac	275

CANON

BJ-200 Ink Jet	319

CITIZEN

GSX 145 24 pin, 132 column	355
GSX 220 24 pin	185
GSX 230 Fonts & Quiet	229
GSX 240 Scalable Fonts & Quiet	285
PN48 1ppm, 2lb, battery, case, for notebook	299
Accessories :	
- Color Option for GSX 130	45
- Color Option for GSX 145	65

HP (Hewlett Packard w. toner)

Desk Jet 500 / 520	275/299
Desk Jet 500C / 550C / 560C	395/499/569
Desk Jet 1200C / Postcript	1385/1995
Jet Direct for 10BT (J2371A) / Combo	429/465
Laser Jet 4 / 4M	*(1385)/1895
Laser Jet 4L / 4ML	639/999
Laser Jet 4P / 4MP	975/1375
Laser Jet 4Si / 4SiMX	2995/4295
Paint Jet / Paint Jet XL300	695/2295
Accessories :	
- Envelope Power Feeder 75 Sheet (LJ4)	279
- Legal, Letter or A4 250 Sheet Tray (LJ4)	99
- Legal, Letter or A4 500 Sheet Tray (LJ4)	109
- Lower Cassette w. Letter Tray (IIP, IIIP)	149
- Optional 500 Sheet Legal Letter A4 (LJ4).	279
- Postcript (LJ4)	359
- Toner for LJ II, III	79
- Toner for LJ IIP, IIP+, IIIP	66
- Toner for LJ4	109
- Toner for LJ4l or 4P	69
- Toner for LJ4Si	135

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Win Printer XL600 11x17, 600x660ppi	2350
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NEC

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- Ink Cartridges	19.50
- Postcript Emulation Card	375
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- Toner KX-P453	42
4420 Accessories	
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- Drum KX-PDM2	99
- Envelope Tray KX-P431	59
- Legal Tray KX-P425	45
- Ozone filter KX-PFT2	29
- Toner KX-P451	42
4430 Laser, 1MB, 5ppm	665
- Accessories same as 4410	
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- Ozone Filter KX-PFT1	32
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4455 Postcript, 11ppm	1695
5400 Led Postcript Page Printer, 4ppm	799
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Others Accessories :	
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- Color Upgrade Kit KX-PCK11	55
- Serial Interface Card PS-13	75
- Single Bin cut Sheet Feeder KX-PT10	95

QMS (Adobe Postcript)

PS410 2MB, 45 Fonts, 4ppm	925
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- Toner	95

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True Type Master Library	19

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Pacific DircetNet for Novell & UNIX	499
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Pacific Page II/XL 4MB, Postcript for HP II	699
Pacific 4 Postcript for HP 4	269
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ScanJet IIP w. Kit	725

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Scanman Color	429
- w. Omni Page OCR	475

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Scan Maker IIXE w. Photoshop	999

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20. TAPE BACKUP

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PC Software Review

NOTA BENE V4.1

Published By: The Technology Group
Price: $179 to $459 (with academic or non-profit organization affiliation and depending on options)
Reviewed By: John Cowan

Nota Bene is a full-featured word processor, optimized for use by teachers, researchers, and students, with a number of interesting features. The most intriguing feature, Lingua, allows documents to be entered, edited, and printed in four alphabets: Roman, Greek, Cyrillic, and Hebrew. With these alphabets, documents can be composed in dozens of languages, from English to Ancient Greek. A single control keystroke switches between alphabets. Type Control-G and alphas, betas, and gammas appear on-screen instead of a's, b's, and g's as you type. Press Control-E and you are once again composing in English. Choose the Hebrew alphabet and characters print from right to left on-screen, a neat illusion. Lingua's alphabets are pleasing, mostly because text rather than full graphic fonts are utilized. Text fonts also allow Nota Bene to maintain the quick keyboard response for which it is known and appreciated.

In addition to Lingua, Nota Bene offers Orbis, a text-based system that enables you to index large collections of files, search for any word in the set, view the finds by sentence or paragraph, and incorporate them into a document you are currently editing.

Also available is Ibid, which aids in preparing bibliographies, and switches readily among the various arcane styles required by different academic publications.

Nota Bene is powerful, but somewhat cranky. It offers both menu system and command line for program control, but the menus are poorly laid out and require too many keystrokes to accomplish most operations. Documentation is only fair, so the learning curve can be daunting. However, practice makes perfect, and these problems diminish with time.

When entering data or editing, Nota Bene is very fast, even on an XT compatible, and it's not a disk hog—important considerations when academic budgets are tight. Nota Bene has a devoted following in academic circles. If you need its special features, it's a good choice. (The Technology Group, 36 S. Charles St., Baltimore, MD 21201. 410/576-2040)

Macintosh Software Review

KAI'S POWER TOOLS V2.0

Published By: HSC Software
List Price: $199; upgrades from v1.x are $49
Reviewed By: Matthew Leeds

In case you've been living in a cave, if you use Photoshop you should get a copy of Kai's Power Tools (KPT). This is a set of thirty-three plug-in filters and extensions that dramatically extend the power and usefulness of Photoshop (as well as other Photoshop plug-in compatible applications like Painter, Premiere, Canvas, DeBabelizer, etc.). And just in case you don't own any of these pro-

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MICROTIMES

grams, this new version comes bundled with MicroFrontier's ColorIt! 32-bit paint program that does support the plug-in architecture.

Version 2.0 adds a speed improvement; support for working directly in CMYK color space; real-time previews in the Gradient Designer, Texture Explorer, Fractal Explorer, and Gradients on Paths filter generators; and improvements to the user interface for the filter generators. In addition, once a texture, fractal, or gradient has been created, it can be applied to an image using one of several new operations, similar to the channel operations found in Photoshop. These new modes include Add, Subtract, Multiply, Screen, and Difference.

The included documentation is also much improved. The earlier manual was difficult to read, and difficult to use. In addition to the material in the manual, several additional documents are included on disc as is a slide show program. You also get a set of PICT files that demonstrate the effects you can get with KPT. (HSC Software, Inc., 1661 Lincoln Blvd., Suite 101, Santa Monica, CA 90404)

KIDART TYPEFACES

Published By: Imager, Inc.
Distributed By: Maxis
List Price: $29.95
Requirements: Mac with System 7, or system 6.0.5 with TrueType INIT. IBM-compatible with Microsoft Windows 3.1.
Reviewed By: Kevin Savetz

When it comes to fonts, I am boring; just your basic 12-point Palatino guy. Maybe I'll fool around with Helvetica if I'm feeling wacky. Basically, I stick with the boring standbys.

That was true until KidArt typefaces arrived in my mailbox. Now, my font choices aren't nearly so boring. KidArt typefaces is a collection of twenty TrueType fonts for the Mac or Microsoft Windows. The fonts are zany and meant to pique the interest of kids. But don't let the name fool you, because these fonts are cool for grown-ups, too.

What's different about these fonts? They're just silly. Imagine a font in which all the capitals were actually crying dinosaurs. Or big-toothed monsters. Or plates of spaghetti. Imagine a font in which all the lowercase letters looked like snakes. All of those things are in KidArt typefaces. You don't need to be a kid to think that's cool.

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- Stereo Output
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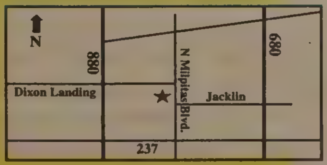

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RESOURCES

Calendar Of Events

CONFERENCES, SHOWS, SPECIAL EVENTS

APRIL

April 2 The Computer Show & Sale. Marin Civic Center, San Rafael. MarketPro. Call: (415)456-6730.

April 3 Computer, Ham Radio, Electronics Swap Meet. Livermore. Livermore Amateur Radio Club. Call: (510)447-3857, 783-8052.

April 5 Silicon Valley Vs. Route 128: Regional Advantage Presentation By AnnaLee Saxenian. San Jose. Computer Literacy Bookshop. Call: (408)435-1118.

April 5–7 Computer Storage Exposition And Conference. San Francisco. Eberhard & Co. Call: (212)486-6168.

April 9 California Computer Show & Sale. Oakland. Robert Austin Corp. Call: 1-800-685-1400.

April 10 California Computer Show & Sale. Pleasanton. Robert Austin Corp. Call: 1-800-685-1400.

April 16 California Computer Show & Sale. Cow Palace. Robert Austin Corp. Call: 1-800-685-1400.

April 19–21 Networks Expo '94 Conference. San Francisco. Blenheim. Call: 1-800-829-3976.

April 23 California Computer Show & Sale. San Jose. Robert Austin Corp. Call: 1-800-685-1400.

April 23 The Computer Show & Sale. Sonoma County Fairgrounds, Santa Rosa. MarketPro. Call: (415)456-6730.

April 23–24 Computer Show & Sale. Sacramento. MarketPro. Call: (415)456-6730.

April 24 The Computer Show & Sale. Center Concord, Concord. MarketPro. Call: (415)456-6730.

April 30–May 1 The Computer Show & Sale. Solano County Fairgrounds, Vallejo. MarketPro. Call: (415)456-6730.

MAY

May 1 California Computer Show & Sale. San Mateo. Robert Austin Corp. Call: 1-800-685-1400.

May 1 Computer, Ham Radio, Electronics Swap Meet. Livermore. Livermore Amateur Radio Club. Call: (510)447-3857, 783-8052.

May 2 Federal On-Site Technology Expo. Federal Building, Sacramento. Federal Business Council. Call: 1-800-878-2940.

May 2–5 Client/Server Technology Fair. San Jose. Smith and Smith. Call: 1-800-650-4321.

May 3 Federal On-Site Technology Expo. McClellan Air Force Base, Sacramento. Federal Business Council. Call: 1-800-878-2940.

May 4 Federal On-Site Technology Expo. Travis Air Force Base, Fairfield. Federal Business Council. Call: 1-800-878-2940.

May 5 Federal On-Site Technology Expo. Sacramento. Federal Business Council. Call: 1-800-878-2940.

May 7–8 California Computer Show & Sale. Cow Palace. Robert

APRIL 16

WIRELESS DATA OPPORTUNITIES FOR SOFTWARE DEVELOPERS

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- 101 Enhanced Keyboard

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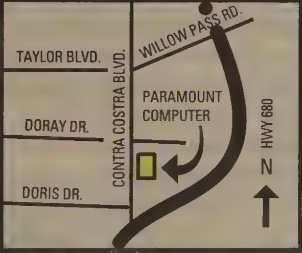

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486DX-33 VL Bus w/ 256K Cache	$315
486SX-33 VL Bus w/ 256K Cache	$205
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Quantum LPS-270A 270MB IDE 12ms	$226
Quantum LPS-340A 340MB IDE 13ms	$265
Quantum LPS-540AT 540MB IDE 12ms	$398
Western Digital WD2250 250MB IDE 13ms	$218
Western Digital WD2340 340MB IDE 13ms	$267
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Western Digital WD2540 540MB IDE 13ms	$398

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NEC 4FGe 15" 1024x768 .28dpi	$658
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Mini Tower w/230 Watts Power Supply	$49
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NEC OEM Tri-Speed 190ms 450Kb/Sec	$429
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HG720 Graphite Pro ISA 2MB VRAM	$398

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MGA ULT2VH Ultima AT 2MB	$489
MGA ULT2AH Ultima VLB 2MB	$489
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USRobotics Sportster 14400bps External	$162
Zoltrix 14400bps Internal Fax/Modem	$115
Zoltrix 14400bps External Fax/Modem	$155

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PARAMOUNT COMPUTER

Calendar Of Events *continued*

Austin Corp. Call: 1-800-685-1400.

May 11–13 Virtual Reality '94. San Jose. *Virtual Reality World* Magazine. Call: 1-800-632-5537.

May 12–13 How To Win In The Global Marketplace Meeting. San Francisco. American Management Association. Call: (518)891-0065.

May 14–15 California Computer Show & Sale. Oakland. Robert Austin Corp. Call: 1-800-685-1400.

May 14–15 The Computer Show & Sale. Cal Expo, Sacramento. MarketPro. Call: (415)456-6730.

May 18–20 Western Regional Government Technology Conference. Sacramento. Government Technology Conference. Call: (916)363-5000.

May 21 The Computer Show & Sale. Sonoma County Fairgrounds, Santa Rosa. MarketPro. Call: (415)456-6730.

May 22 The Computer Show & Sale. Marin Civic Center, San Rafael. MarketPro. Call: (415)456-6730.

May 23 DB Expo '94: Database, Client/Server, And Information Technology. San Francisco. Blenheim. Call: (415)966-8440.

May 23–27 Silicon Graphics Expo. San Jose. Silicon Graphics Computer Systems. Call: 1-800-727-EXPO.

May 25–26 Ed Yourdon On Object-Oriented Analysis And Design Seminar. Santa Clara. DCI. Call: (508)470-3880.

JUNE

June 5 Computer, Ham Radio, Electronics Swap Meet. Livermore. Livermore Amateur Radio Club. Call: (510)447-3857, 783-8052.

June 8–10 Second Annual Virtual Reality And Persons With Disabilities Conference. San Francisco. IEEE and CSU, Northridge. Call: (818)885-2578.

June 12 Computer Show & Sale. Concord. MarketPro. Call: (415)456-6730.

June 13–16 Online Publishing '94. New York, NY. Graphic Communications Association. Call: (703)519-8160.

June 13–16 SunWorld San Francisco. San Francisco. World Expo Corp. Call: 1-800-225-4698.

June 16–18 Art Teco '94: First Annual United Developers Summit. San Francisco. Morph's Outpost on the Digital Frontier. Call: (510)238-4550.

June 20–23 NeXTWORLD EXPO '94. San Francisco. DCI. Call: 1-800-767-2336.

CLASSES, SEMINARS, WORKSHOPS

APRIL

April 1–8 Director 1 Class. San Francisco. Center for Electronic Art. Call: (415)956-6500.

April 4 Intro To Excel 5.0 Class. San Francisco. The Dublin Group. Call: (415)227-4800.

April 4 Intro To Quattro Pro For Windows 5.0 Class. Santa Clara. The Dublin Group. Call: (415)227-4800.

April 4 Microsoft Excel Class. San Francisco. Media Alliance. Call: (415)771-7133.

April 4–5 Microsoft Publisher Class. San Francisco. San Francisco State Extension. Call: (415)904-7710.

April 4–May 23 Intro To Applied Multimedia Class. San Francisco. San Francisco State Extension. Call: (415)904-7700.

April 5 HyperCard Class. San Francisco. Mac Academy. Call: 1-800-527-1914.

April 5 Intro To Windows Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

April 5 Microsoft Excel Class. San Francisco. Mac Academy. Call: 1-800-527-1914.

April 5 Microsoft Word Class. San Francisco. Mac Academy. Call: 1-800-527-1914.

April 5 Microsoft Works Class. San Francisco. Mac Academy. Call: 1-800-527-1914.

April 5–26 MacroMedia Director Class. San Francisco. Media Alliance. Call: (415)771-7133.

April 6 Intro To Computers Class. Oakland. California Computer Options. Call: (510)444-5700.

April 6 Intro To Lotus Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

April 6 Mac Basics Level 1 Class. San Francisco. Media Alliance. Call: (415)771-7133.

April 7 Beginning Macintosh Class. San Jose. Mac Academy. Call: 1-800-527-1914.

April 7 Claris FileMaker Pro II Class. San Francisco. Media Alliance. Call: (415)771-7133.

April 7 DOS 6.0 Class. Oakland. California Computer Options. Call: (510)444-5700.

April 7 Intro To WordPerfect Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

April 7 Microsoft Word Class. San Jose. Mac Academy. Call: 1-800-527-1914.

April 7–8 Netware Getting Started Class. San Francisco. Center For Advanced Professional Development. Call: (714)261-0240.

April 7–8 PC Repair Class. Oakland. Excel Micro Solutions. Call: (510)836-2040.

April 7–8 Photoshop Basics Class. Santa Clara. UC Santa Cruz Extension. Call: (408)427-6620.

April 7–14 Aldus FreeHand Class. San Francisco. Center for Electronic Art. Call: (415)956-6500.

April 7–May 5 The Technology Of Networked Multimedia Class. San Francisco. San Francisco State Extension. Call: (415)904-7700.

April 7–May 26 Audio/Visual Production For Video Games And The New Media Class. San Francisco. San Francisco State Extension. Call: (415)904-7700.

April 8 Adobe Illustrator Class. San Francisco. Media Alliance. Call: (415)771-7133.

April 8 Introduction To PowerPoint 3.0 Class. San Francisco. The Dublin Group. Call: 1-800-464-8344.

April 8–May 6 Advanced Media Synthesis Class. San Francisco. Center for Electronic Art. Call: (415)956-6500.

April 8–May 6 Electronic Post-Production For Independent Film, Video & Multimedia Makers Class. San Francisco. San Francisco State Extension. Call: (415)904-7700.

April 9 A Business Tour Of The Internet Seminar. San Francisco. IIT. Call: (415)621-1908.

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PC MAGAZINES TOP CHOICE DECEMBER 1993

PC MAGAZINE

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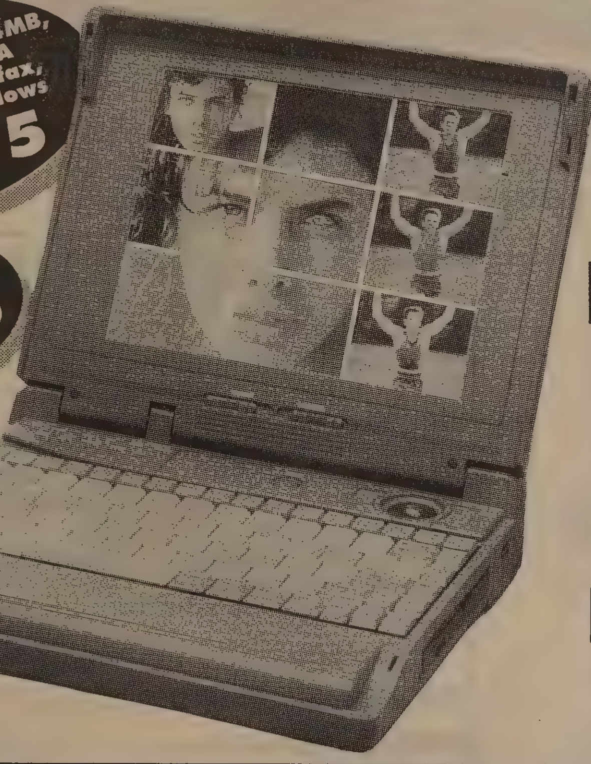
$2,495

MONO 486DX2-50, 4MB, 120HDD,
$1,749



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PC Magazine, Dec. 21, 1993

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- Serial, parallel, external keyboard & CRT ports
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Color Version Available

486-50MHz 2MB, 120HDD, Local Bus
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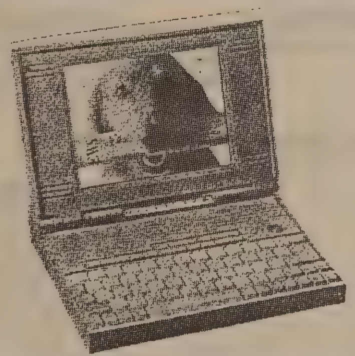

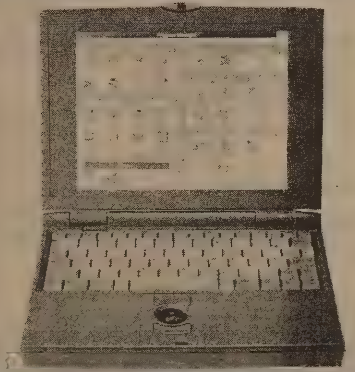

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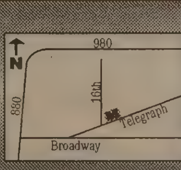

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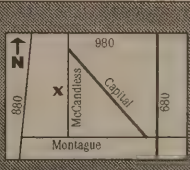

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FC-10 Tape controller w/cables	79
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- NEC 3V 15" .28 SVGA monitor
- Teac 1.2MB and 1.44MB floppy drive
- Two serial, one parallel, one game port
- Focus 2001 enhanced keyboard
- MS DOS 6.2 w/Menu
- Mid-tower with 250W power supply
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20" Trinitron tube 1280x1024 .28dpi T660i	2372
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Sound Blaster Pro Deluxe	67
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Compton's Interactive Encyclopedia	85
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Dune	25
F117A Stealth & F15	23
Family Choice	18
Family Doctor	18
Family Education Collection	18
Game Pak II	18
King's Quest V	15
King Quest VII	23
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Mantis Experimental Fighter	15
Microsoft Bookshelf MPC	29
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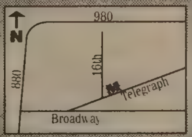

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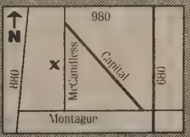

Calendar Of Events *continued*

April 9 IBM PC Clone Hands-On Hardware Workshop. Oakland. Excel Micro Solutions. Call: (510)836-2040.

April 10 Mac Maintenance And Troubleshooting Workshop. San Francisco. Media Alliance. Call: (415)771-7133.

April 10 System 7 Workshop. San Francisco. Media Alliance. Call: (415)771-7133.

April 10–22 Director 2 Class. San Francisco. Center for Electronic Art. Call: (415)956-6500.

April 11 dBase IV, Level 1 Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

April 11 Lotus Notes System Administration I Class. San Francisco. Infotec Training Institute. Call: 1-800-282-7990.

April 11 Lotus Notes System Development I Class. Santa Clara. Infotec Training Institute. Call: 1-800-282-7990.

April 11 Microsoft Excel II Class. San Francisco. Media Alliance. Call: (415)771-7133.

April 11–13 Design For Human/Computer Interface Class. Santa Clara. UC Santa Cruz Extension. Call: (408)427-6620.

April 11–13 System Administration For Netware Class. San Francisco. The Dublin Group. Call: 1-800-464-8344.

April 11–19 Beginning QuarkXPress For Graphic Production Class. Santa Clara. UC Santa Cruz Extension. Call: (408)427-6620.

April 11–June 13 Graphic Design 1: Principles Class. Santa Clara. UC Santa Cruz Extension. Call: (408)427-6620.

April 12 Intermediate PageMaker 5.0 Class. San Francisco. The Dublin Group. Call: (415)227-4800.

April 12 Intro To WordPerfect For Windows Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

April 12 Lotus 1-2-3 4.0 Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

April 12 TMS320C4X Design Workshop. San Jose. Texas Instruments. Call: (408)383-2363.

April 12 Word For Windows 6.0 Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

April 12–May 24 3-D Animation On The Mac Class. San Francisco. San Francisco State Extension. Call: (415)904-7700.

April 13 Intro To Excel Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

April 13 Intro To Quattro Pro For Windows Class. San Francisco. The Dublin Group. Call: 1-800-464-8344.

April 13 Intro To Solids Modeling With AME. Santa Clara. The Copper Connection. Call: (408)970-9838.

April 13 Mac Basics Level II Class. San Francisco. Media Alliance. Call: (415)771-7133.

April 13 Multimedia And Interactive Marketing Class. San Jose. Business Marketing Association. Call: (408)365-9815.

April 13–14 Intro To Networks Hands-On Workshop. Oakland. Excel Micro Solutions. Call: (510)836-2040.

April 13–May 11 Intro To VHDL Modeling Class. Atherton. UC Berkeley Extension. Call: (510)642-4111.

April 14 Intro To MS-DOS, Level 2 Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

April 14 Intro To Paradox For DOS Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

April 14 Lotus Notes System Administration II Class. San Francisco. Infotec Training Institute. Call: 1-800-282-7990.

April 14 Lotus Notes System Development II Class. Santa Clara. Infotec Training Institute. Call: 1-800-282-7990.

April 14 Networks For Legal Professionals Class. San Francisco. Network Services Group. Call: (415)863-8407.

April 14–15 Novell System Supervisor 3.12 Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

April 15 Adobe Illustrator II Class. San Francisco. Media Alliance. Call: (415)771-7133.

April 15 Intro To DOS Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

April 15 Intro To Excel 4.0 Class. San Francisco. The Dublin Group. Call: 1-800-464-8344.

April 15 Intro To Lotus 1-2-3 For Windows 4.0 Class. San Francisco. The Dublin Group. Call: 1-800-464-8344.

April 16 Intro To Word/Word Perfect/Ami Pro Class. San Jose. Infomind. Call: (408)243-1121.

April 16 Mac Basics Level II Class. San Francisco. Media Alliance. Call: (415)771-7133.

April 16 Multimedia Training: An Idea Whose Time Has Come Class. San Francisco. San Francisco State Extension. Call: (415)904-7700.

April 16 QuarkXPress II Class. San Francisco. Media Alliance. Call: (415)771-7133.

April 17 Intro To PowerPoint/Access/Paradox Class. San Jose. Infomind. Call: (408)243-1121.

April 18 Intro To Ami Pro 3.0 Class. Santa Clara. The Dublin Group. Call: (415)227-4800.

April 18 Network Administration Workshop. San Francisco. Network Services Group. Call: (415)863-8407.

April 18–19 Working With AutoCAD ADE Class. Santa Clara. The Copper Connection. Call: (408)970-9838.

April 18–22 Understanding Today's Database Management Class. San Francisco. Digital Consulting Inc. Call: (415)776-5184.

April 19 Intermediate Excel 4.0 Class. San Francisco. The Dublin Group. Call: 1-800-464-8344.

April 19 Intro To Excel/Lotus/Quattro Pro Class. San Jose. Infomind. Call: (408)243-1121.

April 19 Intro To Lotus 1-2-3 For Windows 4.0 Class. Santa Clara. The Dublin Group. Call: (415)227-4800.

April 19–26 Director 1 Class. San Francisco. Center for Electronic Art. Call: (415)956-6500.

April 20 IBM DOS Basics Class. San Francisco. Center for Electronic Art. Call: (415)956-6500.

April 20 Intermediate WordPerfect For Windows 6.0 Class. San Francisco. The Dublin Group. Call: (415)227-4800.

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INTEL 486DX-50 128C VLB	465	600	850	988	1,125	1,440
INTEL 486DX-33 128C VLB	325	460	710	850	985	1,300
INTEL 486SX-33 128C VLB	175	310	560	698	835	1,150
INTEL 486SX-25 128C VLB	155	290	540	678	815	1,130
AMD 486DX2-66 128C VLB	445	580	830	968	1,105	1,420
AMD 486DX2-50 128C VLB	295	430	680	818	955	1,270
AMD 486DX-40 128C VLB	295	430	680	818	955	1,270
IBM 486SLC2-66 64C VLB	285	425	675	810	945	1,260
IBM 486SLC2-50 64C VLB	240	375	628	765	898	1,213
INTEL 486DX2-66 128C ISA	460	595	848	985	1,118	1,433
INTEL 486DX-50 128C ISA	458	595	845	980	1,115	1,430
INTEL 486DX-33 128C ISA	315	455	705	840	975	1,290
INTEL 486SX-33 ISA	158	295	545	685	815	1,130
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AMD 486DX2-66 128C ISA	435	570	820	955	1,090	1,405
AMD 486DX2-50 128C ISA	288	425	675	815	945	1,260
AMD 486DX-40 128C ISA	290	425	675	815	945	1,260
IBM 486SLC2-50	175	315	565	698	835	1,150
486DLC-40 128C w/Math Chip	165	300	550	688	825	1,140
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Orchid Celsius VLB 1 MB	100
Cirrus Logic VLB 1 MB	35
Spider VLB 1 MB	60

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Spectrum 16 Bit SCSI Sound Card	$130
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Promise 4030 VL-II VLB (Exp to 16 MB)	120
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Adaptec 2842 VESA SCSI	280
Adaptec 2742 EISA SCSI	300

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Item	Price
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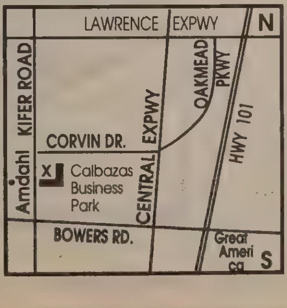

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486DX50C VLB	369	529	779	819	939	979	1,009	1,039	1,109
486DX2-50C VLB	299	459	709	749	869	909	939	969	1,039
486DX40C VLB	279	439	689	729	849	899	919	949	1,019
486DX33C VLB	259	419	669	709	829	869	899	929	999
486SLC2-66CVLB 87SX33Inc'd	269	429	679	719	839	879	909	939	1,009
486DLC40C VLB	169	329	579	619	739	779	809	839	909
486DX2-66C EISA VLB	579	739	989	1,029	1,149	1,189	1,219	1,249	1,319
486DX-50C EISA VLB	519	679	929	969	1,089	1,129	1,159	1,189	1,259
486DX2-66C ISA	399	559	809	849	969	1,009	1,039	1,069	1,139
486DX50C ISA	359	519	769	809	929	969	999	1,029	1,099
486DX2-50C ISA	289	449	699	739	859	899	929	959	1,029
486DX40C ISA	269	429	679	719	839	879	909	939	1,009
486DX33C ISA	249	409	659	699	819	859	889	919	989
486SX33C ISA	169	329	579	619	739	779	809	839	909
486SX25C ISA	129	289	539	579	699	739	769	799	869
486DLC40C ISA	169	329	579	619	739	779	809	839	909
486SLC40C ISA	99	259	509	549	669	709	739	769	839
486SLC33 ISA	79	239	489	529	649	689	719	749	819
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MAG	
MX15F/MX17F	459/829
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15", F34IW, 1024X768 72Hz	589
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17", F550IW, 1280 .28, 75Hz	1,049
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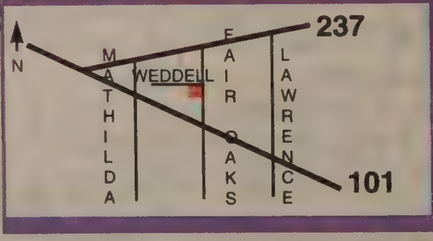

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Calendar Of Events *continued*

April 20 Intro To Customizing AutoCAD Class. Santa Clara. The Copper Connection. Call: (408)970-9838.

April 20 Introduction To Word/WordPerfect/Ami Pro Class. San Jose. Infomind. Call: (408)243-1121.

April 20 QuarkXPress Class. San Francisco. Media Alliance. Call: (415)771-7133.

April 20–22 Novell System Manager Class. Oakland. California Computer Options. Call: (510)444-5700.

April 21 Advanced Word For Windows 6.0 Class. Santa Clara. The Dublin Group. Call: (415)227-4800.

April 21 Intro Windows/Quicken Class. San Jose. Infomind. Call: (408)243-1121.

April 21 Intro WordPerfect 5.1 Class. San Francisco. The Dublin Group. Call: 1-800-464-8344.

April 21–May 5 Adobe Illustrator Class. San Francisco. Center for Electronic Art. Call: (415)956-6500.

April 21–May 12 Computer Media Fundamentals Class. San Francisco. Center for Electronic Art. Call: (415)956-6500.

April 22 Basic Lotus Notes Concepts Class. Santa Clara. Infotec Training Institute. Call: 1-800-282-7990.

April 22 Intermediate Excel 5.0 Class. Santa Clara. The Dublin Group. Call: (415)227-4800.

April 22 Software Licensing Agreements Class. San Francisco. Center for Advanced Professional Development. Call: (714)261-0240.

April 23 A Guided Tour Through The Internet Class. San Francisco. Media Alliance. Call: (415)771-7133.

April 23 The Computer: A Tool For The Artist Class. San Francisco. San Francisco State Extension. Call: (415)904-7700.

April 24 Introduction To QuickBooks/PageMaker/Freelance Graphics Class. San Jose. Infomind. Call: (408)243-1121.

April 25 Introduction To PC/Windows Class. San Jose. Infomind. Call: (408)243-1121.

April 25 Lotus Notes System Application Development I Class. San Francisco. Infotec Training Institute. Call: 1-800-282-7990.

April 25 Lotus Notes System Development I Class. San Francisco. Infotec Training Institute. Call: 1-800-282-7990.

April 25 UnixWare For DOS Users Class. San Francisco. Network Services Group. Call: (415)863-8407

April 25–26 Introduction To Networks Hands-On Workshop. Oakland. Excel Micro Solutions. Call: (510)836-2040.

April 25–26 Writing Windows NT Device Drivers Class. San Francisco. UC Berkeley Extension. Call: (510)642-4111.

April 25–May 6 Interactive Multimedia Intensive Class. San Francisco. Center for Electronic Art. Call: (415)956-6500.

April 25–May 16 Photoshop 1 & 2 Class. San Francisco. Center for Electronic Art. Call: (415)956-6500.

April 25–May 16 Photoshop 3 & 4 Class. San Francisco. Center for Electronic Art. Call: (415)956-6500.

April 25–May 23 Intermediate MacroMedia Director Class. San Francisco. San Francisco State Extension. Call: (415)904-7700.

April 26 Access 1.1 Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

April 26 Intermediate Excel/Lotus/Quattro Pro Class. San Jose. Infomind. Call: (408)243-1121.

April 26 Intermediate WordPerfect 5.1 Class. San Francisco. The Dublin Group. Call: 1-800-464-8344.

April 26 Standard Sensor Signal Processor Design Workshop. San Jose. Texas Instruments. Call: (408)383-2363.

April 27 ACT! For Windows Class. Oakland. California Computer Options. Call: (510)444-5700.

April 27 Intermediate Word/WordPerfect/Ami Pro Class. San Jose. Infomind. Call: (408)243-1121.

April 27 Lotus Notes System Application Development II Class. San Francisco. Infotec Training Institute. Call: 1-800-282-7990.

April 27 Lotus Notes System Development II Class. San Francisco. Infotec Training Institute. Call: 1-800-282-7990.

April 27–28 "How To" Approach To PCMCIA Standard And Technology Seminar. San Jose. Zadian Technologies. Call: (408)293-0800.

April 27–May 25 Advanced QuickTime And Interactive Video Class. San Francisco. San Francisco State Extension. Call: (415)904-7700.

April 28 Advanced Excel 5.0 Class. Santa Clara. The Dublin Group. Call: (415)227-4800.

April 28 Introduction To Windows/Quicken Class. San Jose. Infomind. Call: (408)243-1121.

April 28–May 26 Advanced MacroMedia Director Class. San Francisco. San Francisco State Extension. Call: (415)904-7700.

April 28–May 26 Intro To Authorware Professional Class. San Francisco. San Francisco State Extension. Call: (415)904-7700.

April 29 Advanced WordPerfect 5.1 Class. San Francisco. The Dublin Group. Call: 1-800-464-8344.

April 29 dBase IV, Level 2 Class. Emeryville. Northwest Computer Systems. Call: (510)653-0808.

April 29 Lotus Notes Concepts Class. Santa Clara. Infotec Training Institute. Call: 1-800-282-7990.

April 29–May 13 Director 3 Class. San Francisco. Center for Electronic Art. Call: (415)956-6500.

April 30 Intermediate Excel/Lotus/Quattro Pro Class. San Jose. Infomind. Call: (408)243-1121.

MAY

May 1 Intermediate QuickBooks/PageMaker/Freelance Graphics Class. San Jose. Infomind. Call: (408)243-1121.

May 2 Advanced Excel 4.0 Class. San Francisco. The Dublin Group. Call: 1-800-464-8344.

May 2 Basic Lotus Notes Concepts Class. San Francisco. Infotec Training Institute. Call: 1-800-282-7990.

May 2 Intro Lotus 1-2-3 2.4 Class. Santa Clara. The Dublin Group. Call: 1-800-464-8344.

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May 2 Lotus Notes System Administration I Class. Santa Clara. Infotec Training Institute. Call: 1-800-282-7990.

May 3 Intro Windows 3.1 Class. San Francisco. The Dublin Group. Call: 1-800-464-8344.

May 3–June 28 Graphic Design 2: Techniques Class. Santa Clara. UC Santa Cruz Extension. Call: (408)427-6620.

May 4 Intro Freelance Graphics For Windows 2.0 Class. San Francisco. The Dublin Group. Call: 1-800-464-8344.

May 4 Lotus Notes System Administration I Class. San Francisco. Infotec Training Institute. Call: 1-800-282-7990.

May 4–5 Intro Corel Draw 4.0 Class. Santa Clara. The Dublin Group. Call: 1-800-464-8344.

May 5 IBM PC Clone Hardware Hands-On Workshop. Oakland. Excel Micro Solutions. Call: (510)836-2040.

May 5 Intro WordPerfect 6.0 Class. San Francisco. The Dublin Group. Call: 1-800-464-8344.

May 5 Lotus Notes System Administration II Class. Santa Clara. Infotec Training Institute. Call: 1-800-282-7990.

May 5–June 16 Nonlinear Editing With Adobe Premiere Class. Santa Clara. UC Santa Cruz Extension. Call: (408)427-6620.

May 6 Intro Lotus Approach Class. Santa Clara. The Dublin Group. Call: 1-800-464-8344.

May 7–8 Multimedia And Desktop Video Class. Santa Clara. UC Santa Cruz Extension. Call: (408)427-6620.

May 10 Intermediate Lotus 1-2-3 2.4 Class. San Francisco. The Dublin Group. Call: 1-800-464-8344.

May 10 Intro Quattro Pro 5.0 Class. San Francisco. The Dublin Group. Call: 1-800-464-8344.

May 10 Microsoft Access Part 1 Class. Santa Clara. Infotec Training Institute. Call: 1-800-282-7990.

May 10 TMS320C3X Design Workshop. San Jose. Texas Instruments. Call: (408)383-2363.

May 10–13 CAD/CAM With AutoSURF & AutoMILL Class. Santa Clara. The Copper Connection. Call: (408)970-9838.

May 11 Intro DOS 6.0 Class. San Francisco. The Dublin Group. Call: 1-800-464-8344.

May 12–13 PC Repair Two-Day Hands-On Workshop. Oakland. Excel Micro Solutions. Call: (510)836-2040.

May 14 Roland Desktop CNC Mfg. Class. Santa Clara. The Copper Connection. Call: (408)970-9838.

May 16 Lotus Notes System Application Development I Class. Santa Clara. Infotec Training Institute. Call: 1-800-282-7990.

May 17 Field Programmable Gate Array Design Workshop. San Jose. Texas Instruments. Call: (408)383-2363.

May 18 Lotus Notes System Application Development II Class. Santa Clara. Infotec Training Institute. Call: 1-800-282-7990.

May 18 Lotus Notes System Development II Class. Santa Clara. Infotec Training Institute. Call: 1-800-282-7990.

May 19 Introduction To Personal Computers. San Francisco. The Dublin Group. Call: 1-800-464-8344.

May 20 Introduction To Lotus Organizer 1.1 Class. San Francisco. The Dublin Group. Call: 1-800-464-8344.

May 23 Basic Lotus Notes Concepts Class. Santa Clara. Infotec Training Institute. Call: 1-800-282-7990.

May 23 Lotus Notes System Development I Class. San Francisco. Infotec Training Institute. Call: 1-800-282-7990.

May 24 Intermediate Lotus 1-2-3 For Windows 4.0 Class. San Francisco. The Dublin Group. Call: 1-800-464-8344.

May 24 Microsoft Access Part 2 Class. Santa Clara. Infotec Training Institute. Call: 1-800-282-7990.

May 25 Introduction To PageMaker 5.0 Class. San Francisco. The Dublin Group. Call: 1-800-464-8344.

May 26 Lotus Notes System Development II Class. San Francisco. Infotec Training Institute. Call: 1-800-282-7990.

May 31 Intermediate DOS 6.0 Class. San Francisco. The Dublin Group. Call: 1-800-464-8344.

May 31 Lotus Notes Technical User Class. Santa Clara. Infotec Training Institute. Call: 1-800-282-7990.

JUNE

June 3 Basic Lotus Notes Concepts Class. San Francisco. Infotec Training Institute. Call: 1-800-282-7990.

June 6 Lotus Notes System Administration I Class. Santa Clara. Infotec Training Institute. Call: 1-800-282-7990.

June 7–9 Advanced Database Design And Implementation For Traditional, Distributed, And Object Architectures Seminar. Santa Clara. DCI. Call: (508)470-3880.

June 9 Lotus Notes System Administration II Class. Santa Clara. Infotec Training Institute. Call: 1-800-282-7990.

June 10 Basic Lotus Notes Concepts Class. Santa Clara. Infotec Training Institute. Call: 1-800-282-7990.

June 10 Lotus Notes Technical User Class. Santa Clara. Infotec Training Institute. Call: 1-800-282-7990.

June 13 Lotus Notes System Administration I Class. San Francisco. Infotec Training Institute. Call: 1-800-282-7990.

June 15–17 Building The Information Systems Organization Of The Future Seminar. Santa Clara. DCI. Call: (508)470-3880.

June 16 Lotus Notes System Administration II Class. San Francisco. Infotec Training Institute. Call: 1-800-282-7990.

June 17 Lotus Notes Concepts Class. Santa Clara. Infotec Training Institute. Call: 1-800-282-7990.

June 17 Lotus Notes Technical User Class. Santa Clara. Infotec Training Institute. Call: 1-800-282-7990.

June 20 Lotus Notes System Development I Class. Santa Clara. Infotec Training Institute. Call: 1-800-282-7990.

June 21 TMS320C5X Design Workshop. San Jose. Texas Instruments. Call: (408)383-2363.

June 22 Lotus Notes System Development II Class. Santa Clara. Infotec Training Institute. Call: 1-800-282-7990.

June 27 Lotus Notes System Development I Class. San Francisco. Infotec Training Institute. Call: 1-800-282-7990.

June 29 Lotus Notes System Development II Class. San Francisco. Infotec Training Institute. Call: 1-800-282-7990.

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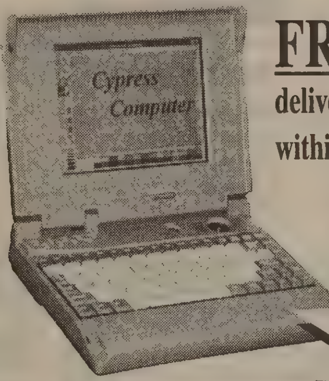

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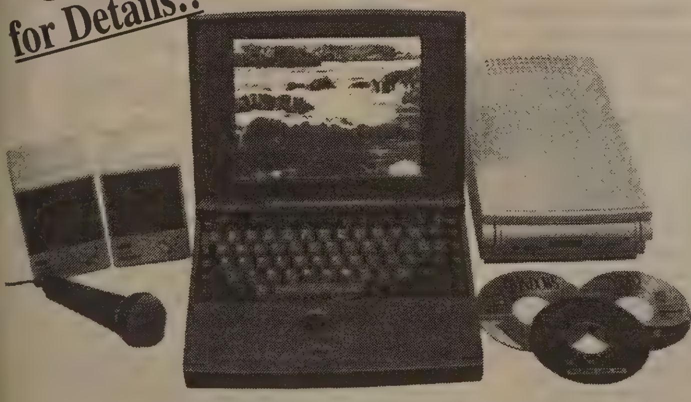

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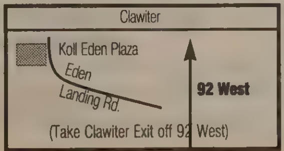

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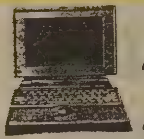

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AT Full Desktop Case w/230W PS	85
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Paul Revere Network. (209)472-0843; 438-7621; 795-1474, 998-8845; (408)947-7800; (510)791-8264; (707)427-1310; (916)361-2827. Nationwide 50+ node BBS network of grassroots firearms rights activists. PRNKIT.ZIP file for full nodelist. [Exp. #121.]

209

BerthaBoard. (209)823-0093. Up to 21,600. HST/V.32ter. Two lines, 6+GB, 65,000+ files, large message base. [Exp. #121.]

The Haunted Castle BBS. (209)826-1900. 2.3 Gig, 10,000+ files online, echo mail, multimedia, Gifs, games, and more. Since 1989. Sysop: David Clifford. [Exp. #122.]

408

#1 Fun Seekers. (408)379-0958. 8-N-1, 24 hrs., 14,400. RIP graphics, IBM files for all ages. Adult too. 4 lines. [Exp. #123.]

Amateur Action BBS. (408)263-3393. 8-N-1, 18,000. Adult amateur GIF files, 32 lines. [Exp. #121.]

BayNar-Net. (408)926-8547. 24 hrs., 2400. Model rockerty, astronomy, IBM programs, family oriented, NAR affiliated. Sysop: Phil Hayton. [Exp. #121.]

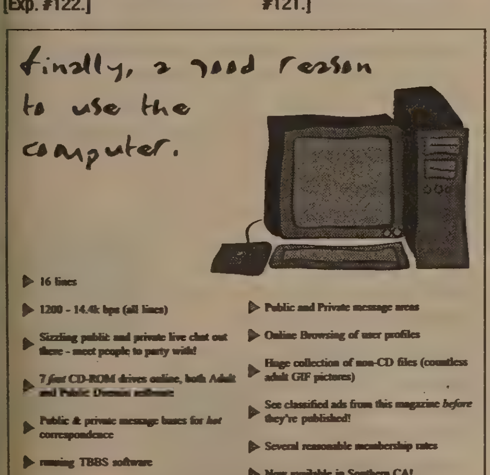
Burn This Flag. (408)363-9766. 14,400. Female callers encouraged to call, two lines. NIRVANAnet. [Exp. #123.]

Casa Del Cyborg. (408)457-2654. 24 hrs., 14,400. First class GUI, Mac files, and active message base. OneNet member. Free. Sysop: Curt and Emil. [Exp. #121.]

The Checker Demon BBS. (408)264-9018. 8-N-1, 14,400. Comic and RPG BBS! Focus on Hero Games products. Sysop: John Taber. [Exp. #121.]

Claris BBS. (408)987-7421. 8-N-1, 14,400. Accessible by both Mac and PC/Windows machines, example files for download, upload files to Technical Support, send email to other users. [Exp. #123.]

Data Vortex Comm. BBS. (408)685-1502. 8-N-1, 14,400. Host/gateway to 1200+ system. "Tech Net," files, forums, and global chat. Sysop: Michael Welch. [Exp. #121.]



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- Public & private message bases for *hot* correspondence
- running TBBS software
- Public and Private message areas
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southern california (new!)
714.741.0900

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Voice Info: 408.956.5650
(membership rates can be found online.)

Escape To Other Worlds BBS. (408)956-1750. 8-N-1, 14,400. SF/fantasy, comics, games, msgs., four lines, D/L files. Mac and PC GIFs, 1.8GB. [Exp. #121.]

Grey Matter BBS. (408)749-0740. 8-N-1, 14,400. RIP graphics, online games, adult graphics, computer consulting. DOS, Windows, games, and more. Free. Sysop: [Exp. #121.]

The Meating Place BBS. (408)926-6174. 24 hrs., 14,400. Gay/Bi, 9 lines, email, chat, matchmaker, GIFs, and more. System password: Micro. [Exp. #122.]

Mongoose BBS. (408)733-3034. 24 hrs., 14,400. SmartNet, adult files, latest sharewares on CD-ROM. Free. Sysop: Robert Yagmourian. [Exp. #121.]

Monterey Gaming Systems. (408)655-5555. 14,400 on all 24 lines. Free Internet email, live chat, contests, games. Free. [Exp. #121.]

The Mountain Mist BBS. (408)353-4866. 8-N-1, 24 hrs., 1200/2400/9600/14,400. Local and Intelec email. PCBoard 15.0/2. Specializing in legal files. OS/2, games, Windoze, Native Am., and other general interest files. Sysop: Christina M. Capurro, Esp. [Exp. #123.]

Paradise City BBS. (408)280-6630. 57,600. Over 35,000+ of the newest files including adult. Relaynet network email. Free first call. Sysop: Jim Reed. [Exp. #121.]

The Screamin' Mac BBS. (408)257-2029. 8-N-1, 24 hrs., All fun. Mac-based with some IBM files. ANSI graphics supported. Sysop: [Exp. #121.]

SJ Advisor. (408)274-6004. 10 am-10 pm. 9600. Politically oriented. San Jose, Santa Clara County, some CA and Federal. Sysop: [Exp. #121.]

The Source BBS. (408)946-6000. 24 hrs., 14,400. 15K+ files: Windows, DOS, programming, graphics, GIFs, UNIX, NT, games, text, word processing. Free. Sysop: Tom Dillon. [Exp. #123.]

The Support Network BBS. (408)259-0297. 8-N-1, 2–8 pm. 14,400. Assistive Technology info, large selection of educational files. Now with RIP graphics. Sysop: Frank Arnold. [Exp. #123.]

The Virtual Reality BBS. (408)246-5434. 8-N-1, 14,400. Games, files, and Net mail. Free. Sysop: Jim Busby. [Exp. #123.]

415

AHA Hydrogen BBS. (415)494-3116. 8-N-1, 14,400. Alternative energy info—prosperity without pollution. [Exp. #121.]

Anatomically Correct BBS. (415) 856-8425. 24 hrs., 2400. Discussions of adult issues, more than 100 X-rated stories. No GIF files. Free. Sysop: Howeird. [Exp. #121.]

A.S.D.I.P. (415)468-3886. 14,400. We are new, deal in adult issues, and offer a free test drive! Three lines, over 8GB online. [Exp. #122.]

The Back Door v2. (415)756-6238. 28,800. 48 lines, adult and alternative lifestyles, Internet, health info, online games, and more. 18 and over only. [Exp. #122.]

Bay Area Luv Connection. (415)822-7550. 24 hrs. Adult board, 16 lines. Fee. Voice: (415)239-1028. Sysop: Ronnie Parker. [Exp. #122.]

Bay Window BBS. (415)755-2939. 9 am–11 pm. Friendly BBS, no GIFs, no routed files, no handles. DOS, games, utils., Windows. Sysop: Judy. [Exp. #122.]

Career Connections. (415)917-2129, 917-2125. 8-N-1. View and respond online directly to the recruiters. Telnet: career.com. Free. Sysop: S. Dave. [Exp. #123.]

Clipboard. (415)239-0454. 28,800. Clipper/IBM programming files, FidoNet, Intelec, Internet newsgroups, and doors. Sysop: George Jereza. [Exp. #122.]

ComPUCall. (415)703-1297. 7-E-1, 1200/2400. California's Public Utilities Commission's calendars, decisions, releases. [Exp. #121.]

Fog City. (415)863-9697. 8-N-1. Gay & lesbian community/chat, matchmaking, CD-ROMs, games. Internet email. [Exp. #121.]

Fun University Network. (415)327-4591. 14,400. 8 lines, intelligent discussions of today's issues, Reuters & AP news, Internet, RIP graphics. Free 30-day trials. Sysops: Wendie, Mike, Lisa, and Scott. [Exp. #123.]

Global Trade Net. (415)668-0422. Devoted to facilitating international trade theory and practice. Job Bank and Business development areas. [Exp. #122.]

Graveyard Shift BBS.

BAY AREA BBSes

By Kathleen Creighton

Mailing Lists On The Net

Several months ago, I dedicated a column to discussing how to access and read Usenet. In the last several months, though, I've noticed that folks online have developed a preoccupation with Internet and BITNET "mailing lists" or "lists" without really understanding anything about them.

Like a Usenet newsgroup, a mailing list is many-to-many communication, where all notes regarding a particular subject are routed out to every list subscriber, usually automatically, but sometimes after collection and editing by a list moderator (in which case the list is called a "digest").

A mailing list can get out of control pretty quickly, filling your mailbox with relevant and irrelevant messages alike. Since many people don't understand how lists work, messages meant for one specific person are often broadcast to the group. (To avoid this, do not reply to the sender of a list message. Instead, to make a private comment, address separate email to the person with whom you wish to correspond.) Individual sysops might want to keep an eye on mailing list volume, which can consume storage resources quickly.

The rangy nature of some lists makes them impractical for users who are paying for their Internet email by the message, like Prodigy users. There was a lot of hype on Prodigy regarding the ability to receive mailing lists before the Internet email gateway opened up. I doubt that there's as much excitement about it now that users have had some experience with them.

Usenet readers should know that there is no way to determine if anyone's public posting on Usenet reflects back to a list, a situation that is becoming more and more common. For example, I replied directly to an address which posted Aids Treatment News in the sci.med.aids newsgroup, only to be informed that my private email to that newsletter had gone out to everyone on a list. Just when you think you know what you're doing, something like this will come along and bite you.

Access to a mailing list is done by "subscription," usually automatically. But in order to subscribe, unsubscribe, or do anything else in your list life, the correct address and the correct name of the list are required. And once you get that information, you should keep it handy in case you want to unsubscribe or you could find yourself in list limbo. I wanted to make what I thought was a minor change in how I subscribed to a mailing list, and now I'm unsubscribed with what seems like no hope of ever straightening it out.

LISTS OF INTEREST

The only general-interest list of Usenet/Internet lists is maintained by Stephanie da Silva and posted every couple of months on Usenet in the newsgroups news.lists and news.answers . It's posted in eight parts and is almost 400K, but it's worth downloading and looking through. This list is only as accurate as the notification da Silva receives. There are lists that are not on the master list, and lists that are no longer active that have never been taken off of the master list.

I've taken a tiny sample of mailing lists so that you can get an idea of how many different types of topics are covered. Be careful, keep track of what you're doing, and enjoy!

"90210"

Contact: 90210-request@ferkel.ucsb.edu (Jim Lick)
Purpose: Discussion of the Fox TV show *Beverly Hills, 90210.*

"adoptees"

Contact: listserv@ucsd.edu
Purpose: The adoptees mailing list is a forum for discussion among adult adoptees of any topic related to adoption. It is not intended to be a general discussion forum for adoption among non-adoptees.

To subscribe, mail to listserv@ucsd.edu with "subscribe [address] adoptees" in the body of the text.

BBSes continued...

(415)397-2812. 14,400. 100% adult files, Throbnet, Swingnet, Wildcat 3.9 RIP, 8 lines. [Exp. #121.]

!Great Divination! (415)327-6748. 8-N-1, 2400. The greatest multiplayer online game, Sorcery. Warning: Addictive. Free trial. Sysop: Gendflor Silvren. [Exp. #123.]

IBBS West. (415)564-9996. 8-N-1, 24 hrs., 14,400. Five lines, PC compatibles, Internet mail, shareware, util., adult GIFs, two CD-ROMs. Fee. [Exp. #122.]

InfoDude Communications. (415)855-9500. 14,400. Multiplatform BBS supporting IBM, Mac, and Amiga, chat, files, PC-SIG online. [Exp. #123.]

Intimate Images. (415)598-0898. 1200/2400/9600/14,400/16,800. Original adult images and video clips. The Bay Area's finest adult files. [Exp. #121.]

Key Software Products BBS. (415)364-9847. 5 pm–8 am, 24 hrs. wknds. 1200/2400/9600. Tech support for the Last Byte Memory Manager. Internet email, fax-mail. Free. Sysop: Dan Lewis [Exp. #122.]

LegalNet. (415)454-0772. 14,400. The California legal community is now online at 14.4 and $6/month. [Exp. #123.]

Marin Online. (415)457-1884. 14,400. The online community of Marin. Sysop: James Preston. [Exp. #123.]

Near Side BBS. (415)369-5063. 14,400. Software support, online games, growing transfer sections. Reg. requested. [Exp. #122.]

New Dork Sublime. (415)864-DORK, 255-NERD. 14,400. As seen in The National Enquirer, two lines, NIRVANAnet. [Exp. #123.]

Recovery BBS. (415)255-2188. 8-N-1, 300/1200/2400. Dedicated to 12-step recovery programs. AA, NA, Al-Anon/ACA, SLAA. Recovery and 12-step Echos. Fido 125/9. Sysop: Rich Gorlin. [Exp. #122.]

R & L Investments. (415)878-9157. 24 hrs., 2400/9600/14,400/16,200/19,200. Large file base, email, online ordering. Business opportunities. RIP graphics. User-friendly. [Exp. #121.]

The Road Not Taken. (415)648-8462. General conversation, discussion of current issues, miscellaneous blather. Free. [Exp. #123.]

Skeptic's Board. (415)572-0359. Science and fringe science. Internet/USENET access. San Mateo. Sysop: Rick Moen. [Exp. #121.]

Solar Hydrogen BBS. (415)494-3116. 24 hrs., 14,400. Alt. energy info—prosperity without pollution. Sysop: Howard H. Smith. [Exp. #122.]

Starnet Of Los Altos. (415)949-3133. 8-N-1, 24 hrs., 300/1200/2400/9600. Email, UNIX, USENET, UUCP, compilers, public domain software. Local to most 408 areas. [Exp. #122.]

The Trade Center BBS. (415)340-0197. 24 hrs., 28,800. Five lines, patches for Flight Sims (Falcon3), adult files, 1.1GB, Internet mail, SimNet, RGSNet support, and more. Free, full access on first call. Sysop: Gabriel Turk. [Exp. #122.]

Tsoft BBS And Public Access Unix. (415)969-7958. 8-N-1, 5 lines. UNIX accounts on the Internet. info@tsoft.net. Free BBS and $5/month. [Exp. #122.]

Uncle D's Directory. (415)364-3001. Computer online service for the mentally aroused. 1.5GB games, unprotects, RIME, classifieds, doors. [Exp. #123.]

/usr/school/BBS. (415)564-8896. 7-E-1, 24 hrs., 1200/2400. How to access the Internet, C & UNIX classes. If garbage, press space. Sysop: Dennis McMamara. [Exp. #122.]

VidGame BBS. (415)742-6486. 2400/9600/14,400/16,800. Steamy adult files, games, 7.5GB/2CD-ROMs. Free Internet email and newsgroups. Sysop: George Hassmer. [Exp. #123.]

Virtual Pleasures BBS. (415)802-0500. Intimate sexual experiences for literate adults. Straight to gay, vanilla to kinky. Women free. [Exp. #121.]

Wetware Diversions Public UNIX. (415)826-0397. 8-N-1, 24 hrs., 1200/2400. Eight lines, full USENET news. Sysop: Eric Swason (editor@wet.UUCP). [Exp. #122.]

Window World BBS. (415)931-0649. 24 hrs. For people who use Windows-type software; info, shareware, chat. Sysop: Bob Cram. [Exp. #121.]

510

& The Temple Of The Screaming Electron. (510)935-5845. 14,400. As seen on Hard Copy. 442MB of unusual text. NIRVANAnet HQ. [Exp. #123.]

8-Bit Apple User Group. (510)294-8052. 24 hrs., 300/1200/2400. Apple II support, email, messages, games, files. Free. Sysop: Noel Anklam. [Exp. #122.]

Activist. (510)532-6248. Lots of conspiracy text files—CIA, KGB, FBI, JFK, RFK, MLK, NSA, ADL, CFR, etc. Sysop: Walter Alter. [Exp. #123.]

Amiga Addicts Anonymous BBS. (510)680-2850. 8-N-1, 24 hrs., 1200/2400/9600/14,400. Amiga files. Free. Sysop: Stanley R. [Exp. #121.]

Bay Area Mega Board. (510)247-8300. 14,400. 16 lines, 26.7GB, chat, GIFs, nets, games, daily international news and magazines. Sysop: [Exp. #122.]

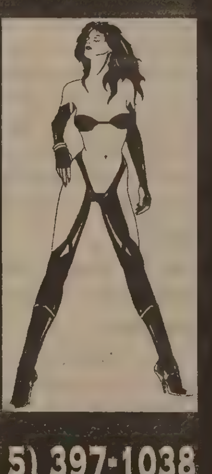
BayB—The Bay Area Baby Board. (510)528-8164. 14,400. Parentsing issues and support: local events, classifieds, games, health, reviews. Mac/PC support. Free. [Exp. #123.]

Bayline BBS. (510)886-9401. 24 hrs., 14,400. Eight lines, African-American issues, Internet email and USENET, business ads, personals, games, and more. 10 hours free. Sysop: A. Mitchell. [Exp. #122.]

Bust Out BBS. (510)888-1443. 24 hrs., 14,400. 9 nodes, 11GB, huge msg and file network (many adult). Computer systems and software services. Sysop: Alex J. Riggs. [Exp. #121.]

Callisto Tower BBS. (510)794-9788. 24 hrs., 14,400. LinkUSA, VampNet, TowerNet Hub. Lots of files and registered doors. Free. [Exp. #122.]

Camphor Fountain BBS. (510)547-5741. 8-N-1. Baha'i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BBS Column continued...

bagpipe

Contact: pipes-request@sunapee.dartmouth.edu

Purpose: Any topic related to bagpipes, most generally defined as any instrument where air is forced manually from a bellows or bag through drones and/or over reeds. All manner of Scottish, Irish, English, and other instruments are discussed. Anyone with an interest is welcome.

bikecommute

Contact: bikecommute-request@bike2work.eng.sun.com

Purpose: We are mainly Silicon Valley folk, and the discussion centers around bicycle transportation, and the steps necessary for improved bicycling conditions in (sub)urban areas.

We do have several folk from around the area, as well as a few national organizations (the League of American Wheelmen, Bikecentennial, and the Bicycle Federation of America).

dragnet

Contact: dragnet-request@chiller.compaq.com

Purpose: To discuss strip drag racing from a participant's viewpoint. (moderated)

Electric Vehicle

Contact: LISTSERV@sjsuvm1.sjsu.edu

Purpose: The EV Electric Vehicle Discussion Mailing List is intended to provide a forum to discuss the current state of the art and future direction of electric vehicles.

To subscribe to the EV mailing list, send the following command to LISTSERV@sjsuvm1.sjsu.edu: "SUBSCRIBE EV firstname lastname". After subscribing, you may enable the digest feature by sending "SET EV DIGEST" to the LISTSERVer.

List owner: Clyde R. Visser, KD6GWN cvisser@ucrmath.ucr.edu

esperanto

Contact: esperanto-request@rand.org (Mike Urban)

Purpose: This list is a forum for people interested in the neutral international language Esperanto. Discussions about the language itself, the Esperanto movement, publications, and news are encouraged; of course, discussion *in* the language itself is especially encouraged, although English translations may be advisable when the material is of interest to beginners or non-Esperantists.

porschephiles

Contact: porschephiles-request@tta.com

Purpose: This list is for people who own, operate, work on, or simply lust after various models and years of Porsche automobiles. It's a good place to ask questions, talk about features and functionality, get advice on what to buy—or for how much—and in general sort of have a little electronic fellowship around the "driving passion" in our lives. Much like a PCA meeting, only distributed and real-time.

This list is currently being run as a mail reflector, sending incoming messages to the whole list, which is currently over 350 people from all over the world. The participants include people with a variety of backgrounds, some very technical, some race/autocross/performance drivers and constructors, some owners, some admiring non-owners.

Rocky Horror

Contact: mossap@essex.ac.uk (Adam Moss)

Purpose: To distribute news and creative material concerning the film: *The Rocky Horror Picture Show*, the stage shows, or anything else in any way connected with the Rocky Horror films or their stars.

Mailings infrequent but reliable.

San Jose Sharks

Contact: sharks-request@medraut.apple.com (Laurie Sefton)

Purpose: discussion, information exchange on the San Jose Sharks hockey team.

SFRaves (San Francisco Raves)

Contact: sfraves@soda.berkeley.edu (Brian Behlendorf)

Purpose: One of several regional rave-related mailing lists, SFRaves covers the San Francisco Bay Area. SFRaves is the original rave mailing list. Also available in digest and calendar-only versions.

The list tends to have high volume. There is also the sfraves-planners list for those who are more intimately involved in planning events. ■

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November 1993, January & February 1994

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- PC World February 1994

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"The *NETiS N4D266VL*'s fine performance, low price, and super support make it the hands-down winner for top overall Best Buy"

- PC World January 1994

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- PC World November 1993

#1 in the PC World Top 20

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Microsoft Defender mouse	$22
Full /Middle tower case	Add $50/$20
Northgate OMNI/Ultra keyboard	$75/$95
High speed serial port (16550 UART)	$35
SoundBlaster 16 Basic	$115
SoundBlaster 16 MultiCD/SCSI-2	$139/$189
Media Vision Pro Audio Spectrum/Studio	$115/$145
Media Vision Fusion double CD-16	$439
Mitsumi CD-ROM (double speed)	$169
NEC CDR-510 3X SCSI CD-ROM	$399
TEAC CD-50 Multispin SCSI CD-ROM	$290
Toshiba 3401B double speed SCSI CD-ROM	$325
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N466VG EnergyStar

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- ☐ Both 1.2MB & 1.44MB TEAC floppy drives
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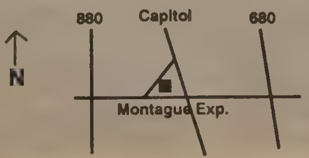

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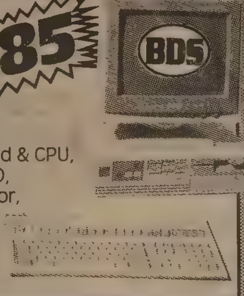

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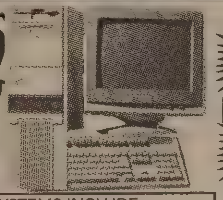

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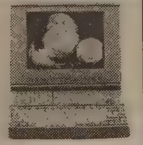

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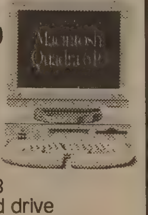

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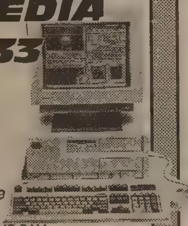

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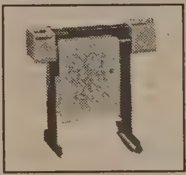

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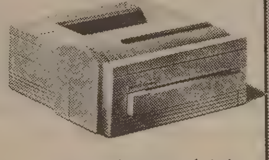

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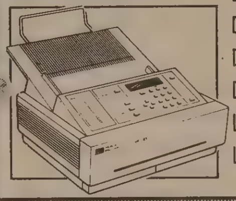

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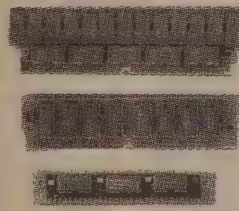

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AMIGA

AGA. Meetings: 7th of each month, downtown San Francisco. Graphics user group for 3-D/2-D, animators, multimedia, and videographers. Call: Ollie, (415)863-8792. [Exp. #123]

AUM—Amiga Users Of Marin. Meetings: 3rd Wed., 7:30 pm, College of Marin Science Center, Rm. 191, Kentfield. Desktop Video SIG, Rm. 192, 6:00 pm. Call: (415)479-6717. BBS: (415)459-6621. [Exp. #126.]

AWEST Amiga Users In SF. Meetings: 2nd Wed., 6:30 pm, Excelsior Branch Public Library, 4400 Mission St. (near Ocean), San Francisco. Call: (415)584-8406. [Exp. #126.]

FAUG—First Amiga User Group. Meetings: 1st Tues., 7:30 pm, HT Electronics, 275 N. Matilda Ave., Sunnyvale. Q &A, new product demos, public domain software. Call: Mike Fisher, (415)855-9816; BBS: (415)341-7566; Usenet: mikef@vid.hp.com. [Exp. #122.]

RE—AMIGA Redwood Empire Amiga User Group. Meetings: 2nd Tues., 7:30 pm, Robert Park Jr. HS, Rm. C-5, 7165 Burton Ave., Rohnert Park. Call: (707)523-9978. BBS: (707)539-6944. [Exp. #126.]

APPLE

PAUG—Peninsula Apple User Group. Meetings: 3rd Thurs., 7:00 pm, Ampex Cafeteria, 411 Broadway, Redwood City. Beginners and advanced, question and answer, new product demos, public domain software. Call: Kent Fillmore, (415)571-1433. [Exp. #126.]

AT&T

AT&T Computer Users Group. Meetings: 1st Wed., 7:00 pm, 50 Fremont St., 40th Floor—near 1st and Mission, San Francisco. Refreshments, technical support, and informal discussions. Also, Sunnyvale DOS and UNIX groups. Call: Jim Lansing, (415)885-6631. [Exp. #121.]

AT&T UNIX Users Group-South Bay. Meetings: 3rd Wed., 7:00 pm, PM new user education. Call: Thad Floryan, (415)961-5157 or USNET: thad.cup.portal.com. [Exp. # 121.]

ATARI

Bay Area Atari Users Group. Meetings: 1st Mon., 7:30 pm, Agnews Aud., 2nd fl., San Jose. Write: c/o 3691 Eastwood Cir., Santa Clara 95054. Call: Steven Lee, (408)988-3878. BBS: (408)986-0215. [Exp. #122.]

Northern California Atari Computer Enthusiasts. Meetings: 3rd Tues., 7:30 pm, Pac Bell Bldg., 3260 Sebastopol Rd., Santa Rosa. Call: Kim Remick, (707)795-8173. [Exp. #126.]

San Leandro Computer Club. Meetings: 1st Tues., 8:00 pm. San Leandro Public Library, 300 Estudillo Ave. 8/16/32-bit, SIGs. Call: Jim, (510)872-1244. [Exp. #122.]

CAD

Marin AutoCAD Users Group. Meetings: 1st Thurs., 6:30 pm, Eldeon Beck Associates, 171 Carlos Dr., San Rafael. Call: Gini Bollinger, (415)491-4722. [Exp. #122.]

Russian AutoCAD Users Of America. Meetings: 2nd Wed., 6:00 pm, Rosenberg School, 5133 Geary Blvd., San Francisco. Call: Michael Belilovsky, (415)387-7764. [Exp. #121.]

SF AutoCAD User Group. Meetings: 1st Mon. Call: Mark Williamson, (415)383-4060. [Exp. #122.]

Southbay AutoCAD User Group. Meetings: Last Thurs. on even months, 6:00 pm. Food, prizes, and more. Call: Dean Villegas, (408)282-4448. [Exp. #126.]

COMMODORE

C=HUG (Commodore Hayward User Group). Meetings: 2nd Sat., 2:00 pm, Palma Ceia Park. (510)531-3734. [Exp. #125.]

CWEST Commodore 64/128. Meetings: 2nd. Wed., 6:30–8:45 pm, Excelsior Library, 4400 Mission, San Francisco. San Francisco. Call: (415)626-9946. [Exp. #126.]

DEC

BayLUG. Digital Equipment Computer User's Society Local User Group. For users of DEC and other hardware. Call: Rich Taylor, (408)776-4978. [Exp. #126.]

DESKTOP PUBLISHING

BMUG Desktop Publishing And Design Sig. Meetings: 3rd Tuesday, 6:30 pm, SF Police Academy, 350 Amber St., San Francisco. Call: Les Cowan, (415)641-6033. [Exp. #122.]

Corel Ventura/Ventura Publishing User Group (Sam Mateo County VPUG). Meetings: 3rd or 4th Mon. (Sept.–May), 6:45 pm, 1800 Rollins Rd., Rm. 14, Burlingame. Call: Elinor Cruze, (415)366-5317. [Exp. #125.]

IBM AND COMPATIBLES

Berkeley PC User Group. Meetings: 2nd Tues., 7:00 pm, Winners Circle Systems, 2618 Telegraph Ave., Berkeley. No charge, newsletter $24/yr, free PD library, beginner SIG, GeoEnsemble SIG. Call: Mel Mann, (510)526-4033. [Exp. #122.]

EastBay FOG. Meetings: 2nd Wed., 6:30 pm, Episcopal Church of St. John-in-Montclair, 1707 Gouldin Rd., Montclair. All microcomputers, MS-DOS, CP/M. Call: (510)653-2627. [Exp. #125.]

Golden Gate Computer Society. Meetings: 4th Mon., 7:00 pm, San Rafael Community Center, 618 B St., San Rafael. Free intro to computers class at 6:00 pm. Call: (415)927-2909. [Exp. #121.]

Napa Valley PC Users Group. Meetings: 2nd Wed., 7:30 pm. Call: Lee Schwab (707)257-2675. [Exp. # 123.]

San Francisco Business Computers. Meetings: 4th Tues., 5:30 pm. 110 Pacific #153, San Francisco. For those who use computers in business. Visitors $5. Call: Jordan Rosenberg, (415)788-5338. MCI Mail: 425-1545. [Exp. #123.]

San Francisco Computer Society. Meetings: 1st Mon., 7:00 pm, Presbyterian Church, 1329 7th Ave., San Francisco. Call: Bob Forsberg, (415)885-6202. [Exp. #123.]

San Francisco PC Users Group. Meetings: 3rd Tues., 6:15 pm SIGs, 7:30 pm General Meeting. Fort Mason, Bldg. A. Call: (415)979-5879. [Exp. #123.]

South Bay WordPerfect User Group. Meetings: Monthly, dates vary. Saratoga Community Library. Free. Call: Scott Maiden, (408)253-4591. [Exp. #122.]

Stanford Palo Alto Area PC User Group. Meetings: Last Wed., 7:30 pm, Varian Aud., 3075 Hansen Way., Palo Alto. Call: (415)329-8252. [Exp. #126.]

Terminal Transfer User Group. For info, send S.A.S.E to Dave Blair, 2440 16th St. #171, San Francisco, 94103. Or Call: (415)431-7621. [Exp. #123.]

LAPTOPS HPX HP

Laptops & Handhelds. Meetings: 2nd Sat., 10:30 am, Sunnyvale. Call: Michael Felsenstein, (415)564-8279. [Exp. #123.]

LEGAL

SF Bar Assoc. WordPerfect User Group. Meetings: 3rd Wed., odd-numbered months, noon, SF Bar Assoc. Boardroom, 7th fl., 685 Market St. Brown bag meetings. Call: (415)421-5650. [Exp. #123.]

MACINTOSH

A32 Macintosh User Group. Meetings: 2nd Sat., 10:00 am, Sunnyvale Community Center, 550 Remington Ave., Sunnyvale. Question and answer, guest speakers, disks-of-the-month, bimonthly newsletter, $35 annual dues. Call: (408)263-0398. [Exp. #122.]

AHUG—Apple HyperCard User Group. Meetings: 3rd Thurs., Apple Computer, Bldg. 4, 4 Infinite Loop Way, Cupertino. Meetings include speakers and topics for beginners and experienced HyperCard and AppleScript users. Call: (408)974-1707. [Exp. #126.]

Diablo Valley Macintosh User Group (DVMUG). Meetings: 3rd Tues., 7:00 pm, Bancroft School, multi-purpose room, 2200 Parish Dr., Walnut Creek. Get together with Mac and Performa users. Enjoyable SIG meetings. Call: Connie, (510)827-5775. [Exp. #122.]

Gay Macintosh User Group. Meetings: 4th Mon., 7:00 pm, New Conservatory Theatre, 25 Van Ness, San Francisco. GMUG is a nonprofit group open to everyone. Call: (415)552-GMUG. [Exp. #121.]

International Macintosh Users Group (IMUG). Meetings: 3rd Thurs., 7:00 pm, Apple Computer, R&D Campus, 1 Infinite Loop, Cupertino. A forum for people using Macintosh computers in different languages. Call: Roger Sherman, (415)859-5146. [Exp. #125.]

Macintosh SIG. Meetings: 3rd Tues., 7:00 pm, Apple Cafeteria, City Center 4, De Anza and Rodrigues, Cupertino. Sponsored by Software Entrepreneurs' Forum. Call: Jeff Cherniss, (408)356-9901, or Barbara Cass (408)854-7219. [Exp. #126.]

PAUG—Peninsula Apple User Group. Meetings: 3rd Thurs., 7:00 pm, Ampex Cafeteria, 411 Broadway, Redwood City. Beginners and advanced, question and answer, new product demos, public domain software. Call: Kent Fillmore, (415)571-1433. [Exp. #126.]

SPC Apple User Group. Meetings: 2nd Tues., 7:30 pm, Fremont Main Public Library. The Society for Prevention of Cruelty to Apple Computers Users Group supports all Apple and Macintosh computers. Call: Dean Fearn, (510)881-9160. [Exp. #125.]

MARKETING

Marketing SIG. Meetings: 4th Thurs., 7:00 pm, Cubberley Community Center, Rm. H-1, 400 Middlefield Rd., Palo Alto. SIG of Software Entrepreneurs' Forum. Call: Bill Ryan, (415)615-7906. [Exp. #122.]

MULTIMEDIA

Macromedia User Forum. Meetings: 1st Wed., 7:00 pm, 600 Townsend, at 7th St., San Francisco. Authoring, 3-D, content, and tools. Call: (415)252-2295. [Exp. #122.]

North Bay Multimedia Association (NBMA). Meetings: 3rd Thurs., 7:00 pm, Semantic, Novato. Call: Lee Callister, (415)883-0449. [Exp. #122.]

SEF Multimedia SIG. Meetings: 1st Thurs., 7:00 pm, Center for Software Development, 111 W. St. John Street, Suite 200, Downtown San Jose. SIG of Software Entrepreneurs' Forum. Call: Ralph Gilman, (408)746-0551. [Exp. #126.]

NETWORKING

NetSIG. Meetings: 4th Tues., 7:00 pm, Novell Sunnyvale. Networking SIG for Software Developers. SEF group. Call: Skip Addison, (408)283-3545. [Exp. #122.]

NOVELL

Silicon Valley Novell User Group. Meetings: 3rd Wed., 6:30 pm, Sundowner Inn, 504 Ross Drive. Call: Stephanie or Beth, (408)522-8690. BBS: (408)739-8753. [Exp. #122.]

OS/2

OS/2 Bay Area User Group. Meetings: 4th Mon., 7:00 pm. For anyone interested in OS/2. Presentations, product demos, questions and answers. Call: (415)948-9186. [Exp. #126.]

PARADOX

Bay Area Paradox User Group (bapals). Meetings: 4th Tues., except June and July, 4th Wed., 4:30 pm, McKesson Bldg., 1 Post St., 18th floor, San Francisco. Call: (415)995-4688. [Exp. #122]

PEN COMPUTING

Pen Software SIG. Meetings: 4th Wed., 7:00 pm, Cubberley Community Center, Rm. H-1, 400 Middlefield Rd., Palo Alto. SIG of Software Entrepreneurs' Forum. Call: Bill McAlpine, (415)348-2257. [Exp. #123.]

POINT OF SALE

Point Of Sale User Group. Meetings: 1st and 3rd Sat., 2025 E. 12th St., Oakland. Call: (510)216-9335. [Exp. #125].

PROGRAMMING LANGUAGES

North Bay Forth Interest Group. Meetings: 2nd Sat., 1:00 pm, 2055 Center St., Berkeley. Tutorial at noon. Call: Leonard Morgenstern, (510)376-5241. [Exp. #122.]

SEF Visual Basic SIG. Meetings: 2nd Thurs., 7:00 pm, Cubberley Comm. Ctr., Rm. H-1, 4000 Middlefield, Palo Alto. Call: Allan Colby, (415)851-4657. [Exp. #122.]

Silicon Valley Forth Interest Group. Meetings: 4th Sat., 10:00–5:00 pm, Applied Biosystems, Inc., Conference Room A/B, 230 Lincoln Centre Dr., Foster City. Call: C.H. Ting, (415)571-7639. [Exp. #126.]

Visual BASIC SIG. Meetings: 2nd Thurs., 7:00 pm, Cubberley Community Center, 4000 Middlefield Rd., Rm. H-1, Palo Alto. Sponsored by Software Entrepreneurs' Forum. Call: Allan Colby, (415)851-4567. [Exp. #122.]

Visual C++ Bay Area Developer's Group. Meetings: 3rd Wed., 6:00 pm, Berkeley. For agendas, location, and RSVP, Call: (510)254-9700, ext. 490. [Exp. #123.]

TEXAS INSTRUMENTS

TI-99/4A. Meetings: 2nd Sat., Oakland. Call: Fred, (510)530-8335. [Exp. #122.]

VIDEO TOASTER

Video Toaster User Group. Meetings: Last Thurs., 7:30 pm, HT Electronics, 275 N. Mathilda Ave., Sunnyvale. Special guests, equipment demos, hands-on workshops, plus info/tips on new System 3.0. Call: Andrew Timmins, (408)243-9233 (eve). [Exp. #126.]

WINDOWS

BAWOW—Bay Area "Windows on Wall Street" User Group. For people interested in actively following the stock market using this revolutionary new software. Call: Dave Ittner, (510)796-4528. [Exp. #122.]

Windows SIG South. Meetings: 1st Wed., 6:30 pm, Cubberley Community Center, Room H-1, 4000 Middlefield Rd., Palo Alto. Software Entrepreneurs' Forum. $10 for non-members. Call: Fran Finnegan, (415)288-4400. [Exp. #126.]

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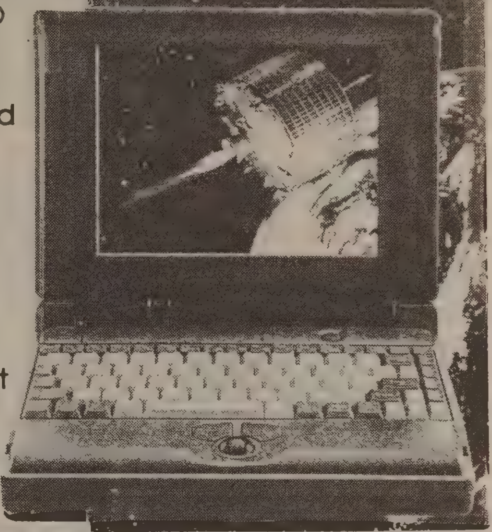

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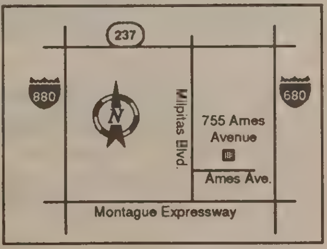

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ASSOCIATIONS

American Association For Artifical Intelligence. Meetings: Individuals interested in learning about the use and application of AI. Call: (415)328-3123, fax: (415)321-4457, email: membership@aaai.org. [Exp. #126.]

The Association For Customer Support Professionals (ACSP). Meetings: Quarterly. Dedicated to the deveopment and furtherance of customer support as a distinct profession, to the growth of the support community, and to the improvement of support service. Call: (510)865-4515. Email: tao@well.sf.ca.us or 71333,2116@Compuserve.com. [Exp. #126.]

Association For Women In Computing. Meetings: 1st Wed., 5:30 pm, Sinbad's Restuarant, Pier 2, San Francisco Embarcadero. $15 members, $20 guests. Call: (415)979-8450. [Exp. #126.]

Association Of Information Systems Professionals (AISP). Write: 922 Weddell Ct., Sunnyvale, CA 94090. Forums, support, network for IS Professionals. Many SIGs. Call: Al Normantas, (408)745-7600. Fax: (408)745-0740. [Exp. #122.]

Black Data Processing Association, Silicon Valley Chapter. Meetings: 4th Thursday, 6:30 pm, Amdahl Corp., Bldg. H, 1240 E. Arques Ave., Sunnyvale. National network of DP professionals, educators, students, and vendor reps. Call: Willie Mackey, (408)280-7624. [Exp. #122.]

Computer Professionals For Social Responsibility. Meetings: Last Sun., 2:00 pm, BMUG Offices, 2066 Center St., Berkeley. Call: (510)987-0567. Email: kec@stubbs.ucop.edu. [Exp. #123.]

IEEE Computer Society, San Francisco Chapter. Meetings: alternating Weds., 7:30 pm, SF State. Call: (415)905-4400. [Exp. #123.]

Independent Computer Consultants Association, Northern California Chapter. Meetings: 2nd Wed., 6:00 pm, Gallaria Parc Hotel, 185 Sutter St., San Francisco. Open discussion, questions and answers. Call: (415)978-9416. [Exp. #125.]

National Association Of Professional Organizers (NAPO). Meetings: 2nd Wed., 6:30 pm, Westin San Francisco Airport Hotel in Milbrae. The cost for guests who pre-register is $12; at the door, $15. Call: (415)461-3537. [Exp. #121.]

North Bay Systems Professionals. Meetings: 3rd Wed., 6:00 pm networking, 7:00 pm dinner, 8:00 pm speaker. Embassy Suites Hotel and Conference Center, 101 McInnis Parkway. NBSP provides a forum for systems professionals to grow and to benefit from a network of other like professionals. Call: (415)721-4409. [Exp. #125.]

San Francisco Computer Society. Meetings: 4th Mon., 7:00 pm, Presbyterian Church, 1329 7th Ave., San Francisco. Call: Bob Forsberg, (415)885-6206. [Exp. #121.]

San Francisco Robotics Society Of America. Meetings: 1st Wed., 8:00 pm, Exploratorium, San Francisco. Free. Call: Brad Smallridge, (415)550-0588. [Exp. #121.]

Society For Technical Communication, Berkeley Chapter. Meetings: 2nd Wed., 6:30 pm dinner, 7:45 pm program, Upstairs at Yenching Restaurant, 2017 Shattuck Ave., Berkeley. Different speaker every month. Call: (510)466-5464. [Exp. #121.]

Society For Technical Communication, East Bay Chapter. Meetings: 1st Thursday. Red Lobster in Dublin. A nonprofit organization for writers, editors, managers, educators, students, and graphic artists. Call: (510)831-1098. [Exp. #122.]

Society For Technical Communication, San Francisco Chapter. Meetings: 3rd Wed., 6:00, program at 7:00 pm. Stagecoach Resturant, 44 Montgomery St., San Francisco. For technical writers, editors, and other technical communicators. Some meetings are dinner meetings, for which reservatins are necessary. Call: (415)985-7121. [Exp. #123.]

Society For Technical Communication, Silicon Valley Chapter. Meetings: 4th Thurs. 5:30 pm cocktails, 6:30 pm dinner, 7:15 dessert. Sunnyvale Hilton, 1250 Lakeside Drive (off Lawrence Expressway at 101). Guest speakers, special interest groups, networking, job listings, newsletter. Call: (408)737-9426. [Exp. #126.]

Software Entrepreneurs' Forum. 3rd Wed., 6:30 pm, Elk's Lodge, 4249 El Camono, Palo Alto. Industry association dedicated to software developers and entrepreneurs, offering information and education on all facets of the software industry. Call: Information, (415)854-7219; reservations, (415)965-9003. [Exp. #126.]

Software Process Improvement Network. Meetings: 3rd. Wed., San Ramon. For people interested in software process improvement, including theory and practical experience. Free. Call: Janet Deeney, (510)823-2348. Email: jmdeene@pbl.pacbell.com. [Exp. #123.]

United Sysops Association (U.S.A.). Meetings: 2nd Wed, 7:30 pm, call for location. Call: Beth Hall, (408)522-8690. [Exp. #123].

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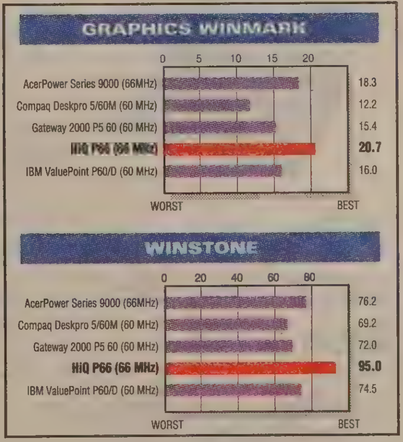

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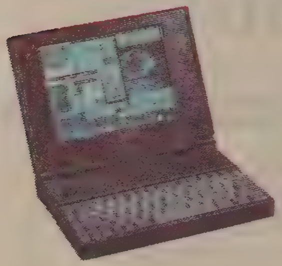

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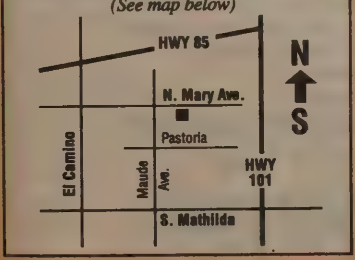

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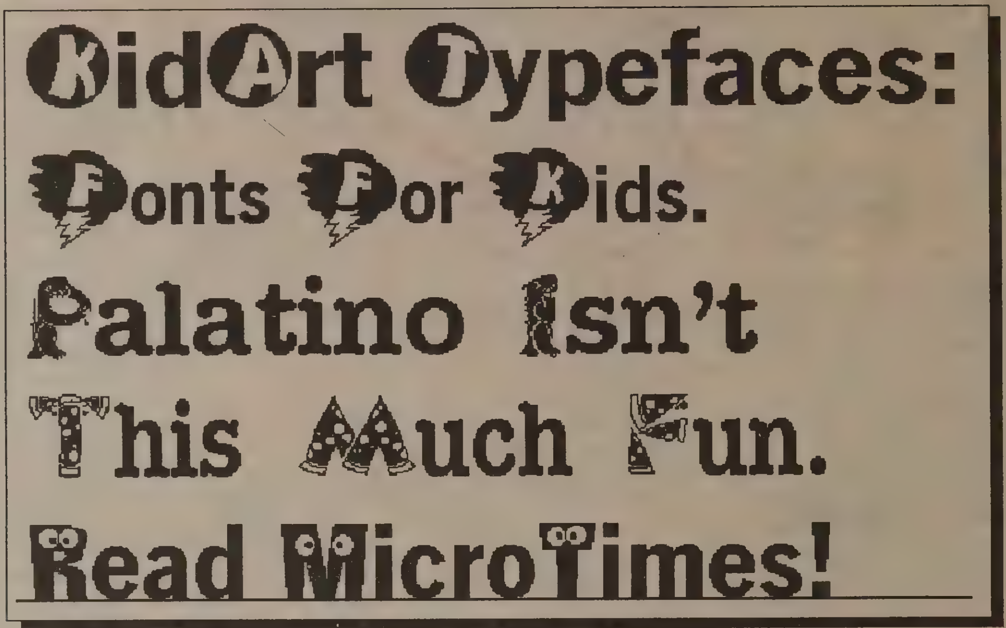

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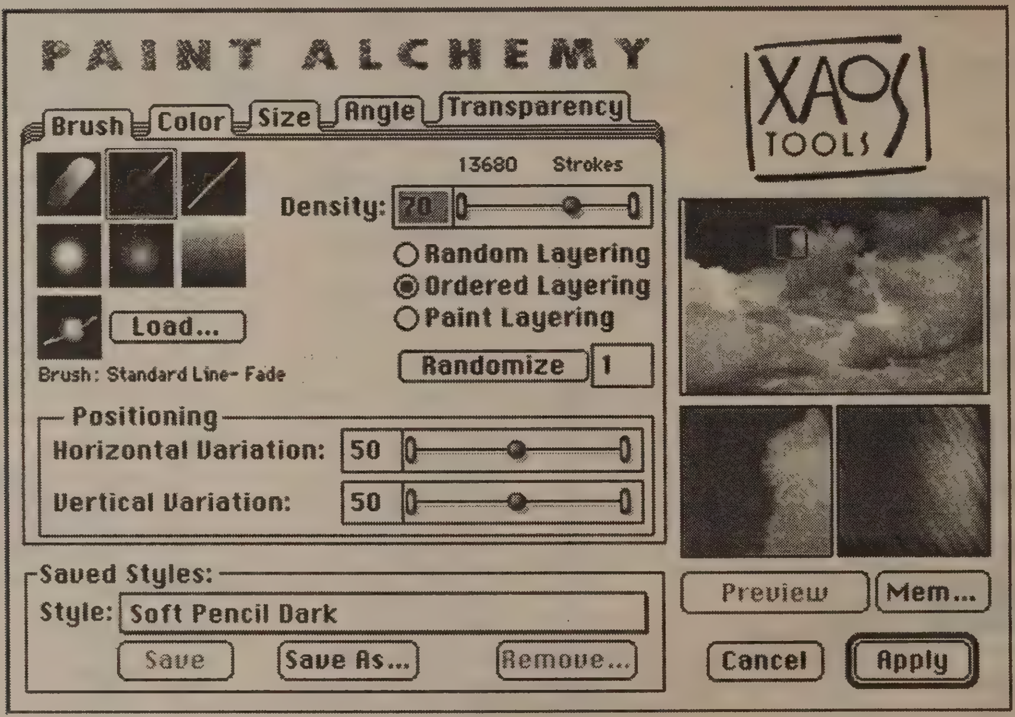

13680 Strokes
Density: 70
○ Random Layering
● Ordered Layering
○ Paint Layering
Randomize 1
Brush: Standard Line- Fade
Positioning
Horizontal Variation: 50
Vertical Variation: 50
Saved Styles:
Style: Soft Pencil Dark

Continued from page 248

There are ten basic fonts in the set, and each font is accompanied by a close variant—for instance, with different shading or italic slant. The names are as inspired as the typefaces themselves: BlokHead, DinoSob, PastaAldente, PizzaMunch, and so on.

Fun and font frivolity aside, it must be noted that most of these fonts look their best big. With anything less than 18 points, the fonts lose their style and become hard to read, especially on-screen. You—I mean, your kids—will probably want to use KidArt fonts in headlines, posters, and whenever display text is needed. Also, some of the typefaces are complete with all the punctuation marks, upper- and lowercase letters, but others are lacking in certain characters. (Two of the fonts don't even have uppercase letters.) No matter, these fonts are supposed to be fun, and they are. We're not talking about professional typesetting; we're talking about letters that make you smile—and smile back at you. (Imager, Inc., 908/233-9155)

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Reviewed By: Matthew Leeds

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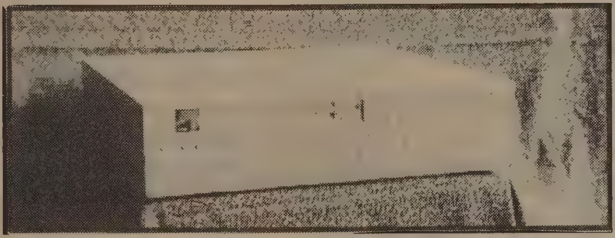

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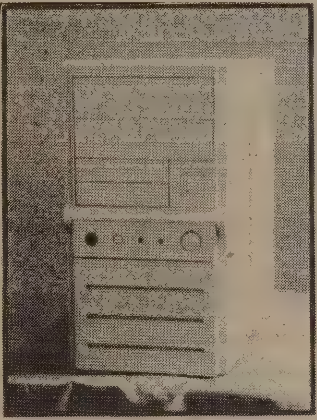

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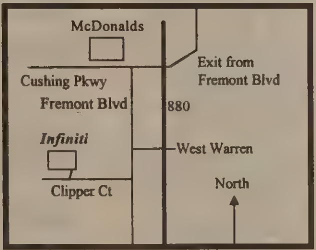

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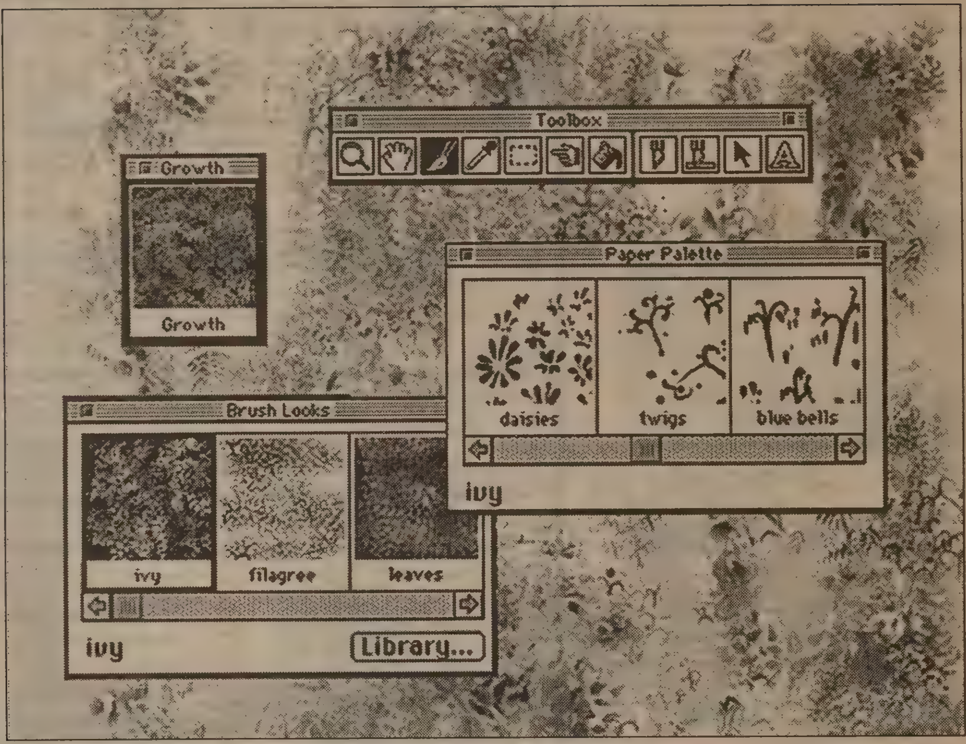

pre-built brushes included with the product. You can infinitely modify any existing brush or build your own.

The results of using Paint Alchemy differ from that of many other add-in filters for Photoshop. Since the brush effect varies depending on the contents of the image, rather than looking like a screen applied to the image, brush effects appear more organic.

The large number of options or styles that can be created require some experimentation to understand. The quick preview window in the user interface does make things easier, but Paint Alchemy is not a speed demon when working with large images. (Xaos Tools, Inc., 600 Townsend St., San Francisco, CA 94103. 415/487-7000)

TREES AND LEAVES

Published By: Fractal Design
List Price: $29.95
Reviewed By: Matthew Leeds

A year ago Fractal Design shipped v2.0 of Painter. Painter does a remarkable job of emulating the look of natural media: painting, charcoal, even the look of natural paper. It offers some great tools including the ability to apply lighting to an image, to record and play back a painting session, and great masking controls. It also has a brush stroke designer that lets you edit and customize your brushes. A Painter brush includes the stroke style, paper grain, and color.

Trees and Leaves is a library of brushes that emulate natural flora. This makes it possible, for example, to paint with ivy, ferns, or vines. These brushes are perfect for landscape architects, urban planners, or anyone who wants to create instant vegetation. They can be used in natural settings or to create a unique background.

There are two dozen brushes in the collection. Installation is simple, and anyone who has already worked with Painter will have no problem using them. If you need to create an English garden, industrial park, or wooded glen, I suggest you get a copy of Painter and Trees and Leaves. (Fractal Design, Inc., 335 Spreckles Dr., Aptos, CA 95003) ■

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Multi & Media beyond

MULTIMEDIA 101

Fabrice Florin & The Heartbreak Of CD-ROM

BY JONATHAN E.

Wacky Jacks and *Travelrama USA* are a pair of newly released CD-ROM titles from StarCore, Apple's software publishing and distributing group in its Personal Interactive Electronics division. Fabrice Florin is the executive producer of both CD-ROMs. This might surprise you if you were to read a couple of postings he made in the summer of 1991 to "The Heartbreak of CD-ROM" topic of The WELL's Muchomedia conference. At that time, the multimedia potential of CD-ROMs was so muddy that his powerful and emotionally intense statements epitomized the dissatisfactions currently inherent to the medium. There are many still suffering from that heartbreak and, interestingly, the topic has recently come alive again with new postings. Florin, however, has found a way to get around CD-ROMs' limitations, and these two titles demonstrate valuable lessons in what can be done and how it can be done.

This is worth remembering as recognition, or acknowledgement, of the roller-coaster ride most multimedia pioneers have experienced over the past several years. Early theories and hopes have crunched up against then-current technological reality, hyped-up publicity has outstripped any actual delivery, and only now are some technology and markets becoming reality, only now is at least some authentic delivery being made on some of yesterday's promises. Meanwhile, new visions of multimedia's potential have been formulated and new promises have been made. Only one thing seems clear and that is that the job of sorting out the fanciful exaggerations from the facts of the technological and communications evolution (or is it a revolution?) we are experiencing is a long way from over.

Copyright © 1994 by Jonathan E. All rights reserved. Jonathan E. has worked with desktop multimedia since 1988. He also writes about world music and the Archaic Revival for BAM. His USPS mailing address is c/o SoundSwell, 54 29th St., Richmond, CA 94804. His email address is jeve@well.sf.ca.us

A LITTLE HISTORY

Born in France, Florin has a long involvement with new media on this side of the Atlantic. A recent conversation with him provided insight into both his career path and the issues that all content developers must contend with. In the late '70s and early '80s, he was head of Videowest Productions, Inc., producing youth-oriented, magazine-style programming for ABC, MTV, and the USA Cable Network as well as music videos for record labels.

He got into computer multimedia just as it began to make its long slow march from the gleam-in-the-eye stage towards reality. He explains, "I always was curious about what would happen when computers and video converged. In order to pursue that interest I produced a documentary on computer hackers back in 1984, based on the first Hackers Conference, which *Whole Earth Review* organized. I interviewed twelve different hackers, not the cracker-types but the midnight programmers.

"The twelth individual was Bill Atkinson. Bill was, at the time, talking about this vision that he had of types of programs that would let you experience entertaining adventures, that would let you bounce around from one node of information to the other and turn learning into fun. The basic concept was that you'd blend entertainment and information together. His words kept echoing through my head long after the interview was over and I thought, 'I could do something like that.'

"That's where I came up with the idea of an electronic atlas, which would allow you to circumnavigate the globe until you found an area of interest, zoom down to that particular place, and view the creatures and cultures that inhabit it, sort of a cross between *Powers of Ten* and *Family of Man*. I basically designed the blueprint for this, sent it off to Bill, and said, 'I bet you you can't do this on your Macintoshes. You got any idea of what technology would be available to do this stuff?'

"Lo and behold, it turned out that Bill was actually designing Wild Card, which was to become HyperCard. He left a message on my home machine, and one on my work machine, to say 'We've got to get together' because the diagrams that I'd sent him were card-based. Essentially they described how you might be able to put together an electronic atlas with a series of 'cards' that were all tied to each other programmatically.

"Basically what that did was to provide him with the impetus to go ahead and get over the writer's block that he was experiencing at the time and deliver HyperCard because he had a user that needed it so badly—the prototypical author, multimedia author, yours truly. So he made me an offer that I couldn't refuse, which was that I would get Wild Card three years before anybody else, that he would write little special drivers to help me mock up a video disc-based prototype.

"I ended up developing the first multimedia application of HyperCard. Every two weeks I would go to his house. I'd show him how I was doing, I'd tell him what I hated and loved about the program. He'd fix it and improve it. There was a great symbiotic relationship between the prototypical application developer and the toolmaker.

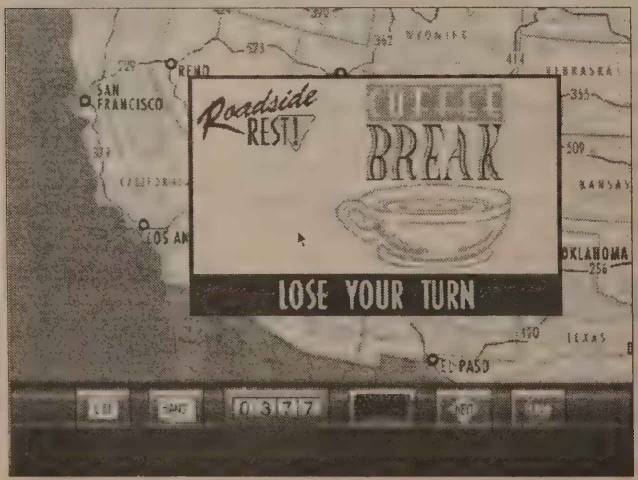
"That lead to Apple making me another offer I couldn't refuse—to license rights to the prototype and have me become one of the founding members of the Multimedia Lab, which I did in '86.... Basically, we tried to figure out what this multimedia thing was all about. We were probably the first ones to use the word multimedia. I don't claim any credit for it—I still think it's an awful word.... We focused on multimedia in education, did very interesting R&D for several years, came up with interesting prototypes and some actual products like the *Visual Almanac* and *Life Story*, which are in schools now and are being used—prototypical examples of what can be done with this in education. Then, in 1991, I was asked by Apple to form a spin-off unit to focus on consumer applications of these beautiful multimedia technologies. The idea was that we would be production oriented, that we would produce actual CDs as well as vision pieces and mock-ups of interactive TV applications."

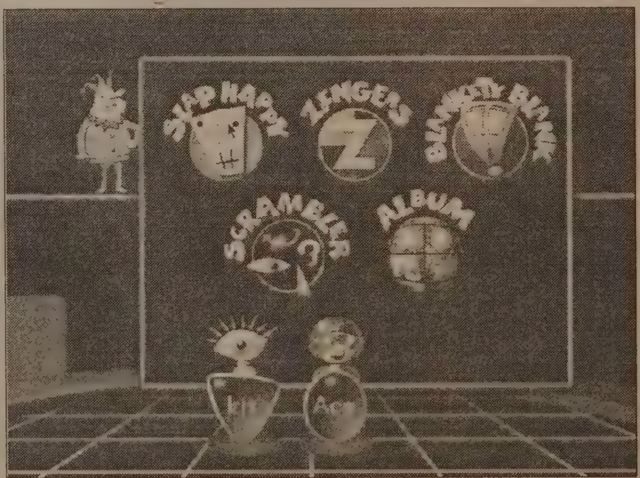
WHAT THE CONSUMER WANTS

In order to produce CD-ROMs that would be successful in both today's marketplace and tomorrow's, a lot of user testing was done. Florin explains, "That involved designing remote controls, designing screens, designing what the end-user application is. When you're essentially competing with NBC, ABC, CBS, what does the customer want you to do with this interactive technology?

"Finally, last year we felt that the time was right to start putting out some of the products we had been working on. So we released those first two titles, *Wacky Jacks* and *Travelrama*. We applied some of the lessons we'd learned from our interactive TV research, which is, first, that most of our customers expect these multimedia experiences to play on their TV ultimately. They're willing to use them on their PC or Macintosh for now, but the computer den in the home is not the ideal place for multimedia experience. People would expect to enjoy them in the family room or in the living room where it can become a group experience, not just a solitary experience.

"So we focused on titles that encourage group interaction. We designed them in such a way that we wouldn't have to redesign them when interactive





Far left: Travelrama USA; near left: Wacky Jacks.

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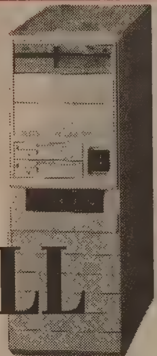

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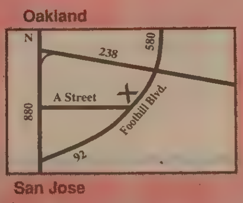

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TV comes of age, when decent players capable of playing CDs come in large quantities to people's TV sets. We wanted to be sure to be able to port our software over without having to redesign it. We've been very market driven in that we brought hundreds, *hundreds*, of families and TV households through this shop. Every two months we'd get another batch of fifty or sixty people. We've been doing this constantly for the past three years.

"That's gotten us to get really in touch with our customers. We've been careful to not select heavy computer users, but rather ordinary folks who've got a life to live and who only have so much time in their lives to try some of these new things, whose expectations are different from computer users'. We've taken those expectations as well as their reactions to our products and we've turned them into something we think is friendly enough and easy enough and attractive enough that people will want to take those precious minutes out of their daily lives and enjoy what we've got to offer.

"The first two titles then are family games, they're aimed at multiple players with different levels so that the parent and a child can sit down together and both can have a good time. The parent won't get bored to tears like they are by Nintendo games. The kids will have a good time and won't feel like it's the parent forcing some education on them. Both age groups are having a good time, there's a lot of social interaction in the room, eye contact, laughter, wisecracks, people sort of elbowing each other. The feeling is that the computer screen is not the be-all and end-all, but it's merely a catalyst for engaging people to do things together. It's to bring people together through technology—that was a very important goal, for which I think parents are going to reward us, families are going to reward us.

"Already, when we ask folks 'What do you think this is worth?' they're saying, 'Whatever Nintendo costs, and given that you've shown me that it's also good for my kid, I'd even pay an extra ten bucks, twenty bucks for it.'"

WHAT MAKES GOOD MULTIMEDIA—THE ESSENTIAL INGREDIENT

This user testing has provided Florin with the essential ingredient for a satisfactory interactive experience. "One of the things we've learned is that people like having an activity that is fairly structured once they open up one of these multimedia things. So the games provide us with a template for what to do with it.

"Essentially you get motivation and feedback. People fall into the experience very naturally when it's a game. When it's an atlas, if you browse, the activity is less compelling. We all thought when we started multimedia that people would be happy to just browse for the rest of their lives. It turns out in reality that browsing is something that's time-consuming that still forces you to sit in front of the screen, which is not always the most enjoyable experience, and that in fact you really need to find a more structured activity to really engage people in a more continuous fashion. The repeat factor is not there on a browsable product as much as it is on something that has a little bit of structure. People enjoy browsing a little bit but they say, 'Okay, I've browsed it,' and that's it. And they put it back on the shelf."

Florin emphasizes that developers of multimedia products should "try to find a fun element that takes advantage of the unique capabilities of the interactive medium to jumble things up and to challenge you to put things back together. It's a wonderful medium for composing and rearranging things. Your typical browser does not allow you to do that. So, at the very least, people should come up with a front end that allows you to do something in a virtual hands-on manner where you can say, 'How about this and this together, how about this and this together?' Unless they provide this kind of front-end, hands-on activity where people are engaged in more than just browsing and reading, I think that unfortunately a pure browsing reference is going to end on the shelf more often than on the screen."

THE REVIVAL OF CD-ROM

I ask Florin about his postings on The WELL and his current position on CD-ROM technology. He replies, "It turns out actually that you can do more with it than we initially thought. I'm not necessarily in love with the primary technology, but it turns out that it's ubiquitous—or getting more ubiquitous—than any other multimedia technology and so, for now, it'll do just fine.

"I'm not saying that it's forever, that it's going to be the technology we're going to use, but it's been adopted as a standard by the majority of the market and so we've decided to go along with the rest of the folks. It's not the ideal technology but it's the best technology there is—the best platform there is.

"At that time, we were working a lot with full-motion video and with multimedia applications whose requirements were such that the CD was not the best device for delivering the experience. Since then we've learned what are good experiences the CD can deliver elegantly. We're not trying full-screen, full-motion video. Instead we're creating those games, combinations of still pictures, nice sounds, and limited animations. That's something that you can do well.

"Also, with the advent of faster CPUs and the advent of double-speed CD drives, a lot of these speed issues inherent in the technology have been resolved or at least are getting better. Back then we didn't have those fast CPUs and we didn't have the double-speed drives."

THE PRODUCTS

All this experience and user testing have paid off handsomely as far as making *Wacky Jacks* and *Travelrama USA* fun, entertaining, and easy-to-use products. Both are delightfully straightforward and deliver exactly what they are supposed to.

Wacky Jacks is a collection of four basic games in a game show format hosted by Wacky, a cartoon character amusingly voiced by the inimitable Mark Petrakis. Slap Happy involves matching pictures on the screen as they move around; Zingers is a tic-tac-toe game in which you answer questions related to the pictures and attempt to get four in a row; Blankety-Blank is a spelling game of filling in the blanks with clues provided by the pictures; Scrambler is a puzzle of correctly arranging the pieces of the picture.

Travelrama is an electronic "board" game where you travel around the USA collecting the necessary postcards. Both titles allow single players, although the real point is to play with others. *Wacky Jacks* has three levels of difficulty available to each player, while *Travelrama* has two. StarCore says that the games are suitable for ages 7 to 107, but *Wacky Jacks* should also be fun for children a couple of years younger.

Currently the games are available for color Macintoshes with a 68030 or faster processor at a retail price of $39.95. Both titles will be available for Windows machines in May. Call 1-800-708-STAR for details or check your local computer store. ■

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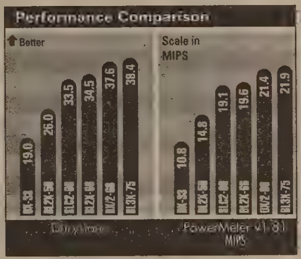

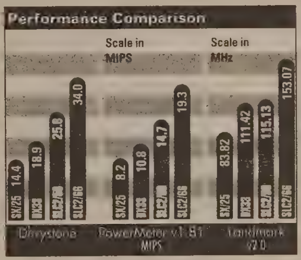

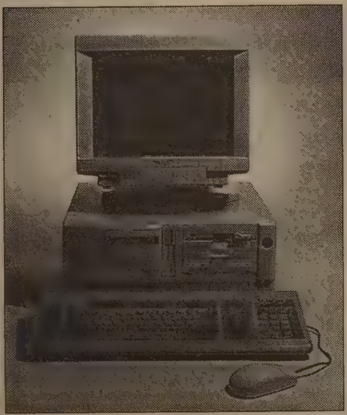

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MultiMedia & beyond

Gulch Gossip

By Jonathan E.

In the March issue of *Wired* (you know—that multimedia event on paper at both the literal and figurative heart of the Gulch), **Paul Saffo** of the **Institute for the Future** declared that point of view and context, rather than content, will be the most valuable and desired assets in the coming online multimedia market, which will otherwise be so mishmashed as to be little more than a confusing thicket of media choices.

▼ ▼ ▼ ▼ ▼

Ironically proving his point comes word that **Ziff-Davis** has begun enforcing a ten-year-old contract with **Fred Davis**, until now writer of *Wired*'s Fetish section. The contract forbids Davis from writing for competitors, and Ziff is readying a new "digital lifestyle" magazine, so far unnamed, that has been described as "*Wired* for dummies."

▼ ▼ ▼ ▼ ▼

Ken Coupland, writer of many *Wired* reviews in the Street Cred section and contributing editor to ***OnLine Design***, has recently finished work on what is billed as the first mass-market book on multimedia, *Multimedia Home Companion—The Best in Interactive Entertainment.* He contributed a section on the aesthetics of multimedia and, Coupland said, "a slew of other *Wired* writers including **Gareth Branwyn** and Fred Davis went nuts writing reviews of about three hundred titles." The book will be available in November under the **Epicenter** imprint by **Warner Publishing**.

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If all this talk of the online multimedia market of the future has you confused, check into a seminar about and demonstration of the **Internet**, presented by **Cliff Figallo** and **Matisse Enzer**. While it's designed primarily for journalists, I suspect that at least some aspects will be of use to other media professionals. Topics to be covered include historical background of the Net; how to use it as a tool and as a source for live and archived information; how notable online journalists such as **Philip Elmer-DeWitt** of *Time* and **John Markoff** of the *New York Times* have made the Net their beat; the news stories behind and inside the Net; how people are creatively using it today; what to look for in the present and the future; how networked publishing might replace the print newsmedia of today; when the Internet may become an effective political tool; and, perhaps most importantly, if and when it will be replaced by something better.

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Figallo and Enzer have eighteen years of computer networking experience between them. Figallo was director of the **WELL** from 1985 to 1992, and Enzer was the WELL's customer support manager from 1992 to 1994. The seminar will run from 1–4 pm on April 20th at the Climate Theatre, 252 9th St., San Francisco. Advance registration is $60, at the door $75. Further info from Figallo at (415)381-8031 or Enzer at (415)469-8271.

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For a look at another aspect of the multimedia future, call **Ken Grisnak** of **Digital Conference Television** and wangle yourself an invite to one of his Wednesday morning gatherings in the Bank of America building. DCTV provides high-quality videoconferencing facilities within the price range of small-to-medium businesses. The Wednesday morning groups are to demonstrate the abilities of DCTV's videoconference boardrooms with a link to DCTV's Chicago and Los Angeles offices. One of the fun things about the mornings is the variety of professionals checking the service out; you may find yourself mixing with lawyers, creative types, federal bureaucrats, psychiatrists, and nonprofit staff members, both here and face-to-face in Chicago or Los Angeles. Call Grisnak at (415)705-6020 to wangle that invite.

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Real parties and slightly strange behavior are two hallmarks of a real media business. **David Saxon** of **Now What Software**; **Chris Ray**, the newly elected president of the Bay Area chapter of the **International Interactive Communications Society**; **Sherry Huss** of **Renga Software**; and **Bob Risse**, a partner in **Interactive Media Partners**, threw a really good party in mid-March at Ray's Upper Market house, with absolutely divine desserts provided by Huss. About half the Who's Who of the local multimedia world were there. The journalists mostly hung out together on the deck getting drunk, bumming cigarettes, swapping amusing and slightly scurrilous stories about such celebs as **Bill Gates** and **Tonya Harding**, and generally being rowdy, while the serious producers talked about hardware and software inside.

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In the Department Of Strange Virtual Behavior, Saxon claimed to be doing a Living Art project that involves his going to developers' offices with no clothes on—he was sufficiently convincing that I was most disappointed when he later revealed that it was all a joke! Perhaps someone should take this idea and implement it.

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Miscellania: **Jeff Dewey** reports that **Luminaria** recently shipped the Mac version of its first product, *Wrath of the Gods*, a CD-ROM adventure game based on the Greek myths. The MPC version should be shipping as this column appears. Distribution is by Maxis. Luminaria is already at work on a new title, also based on cultural and historical role playing.

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Tony Barreca, President and CEO of **Magic Circle Media**, announces successful completion of a video for **Sun Microsystems** envisioning the user interface of the networked multimedia future.

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Medio Multimedia's *JFK Assassination: A Visual Investigation*, reviewed in my Multimedia 101 column in our January issue, was selected as "Best Multimedia Title" of the year in ***Electronic Entertainment***'s Editor's Choice awards.

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And finally, the Editor-In-Chief of this very publication, **Dennis Erokan**, ventures into the multimedia waters with **George Daly**, veteran A&R man for several major record labels. Together, they've formed **CubeArt** to produce music- and video-based CD-ROMs of both well-established and up-and-coming artists. Undoubtedly more details will follow. ■

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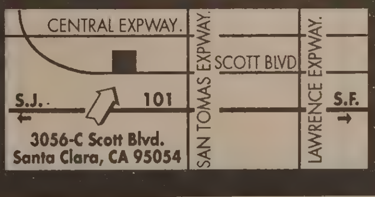
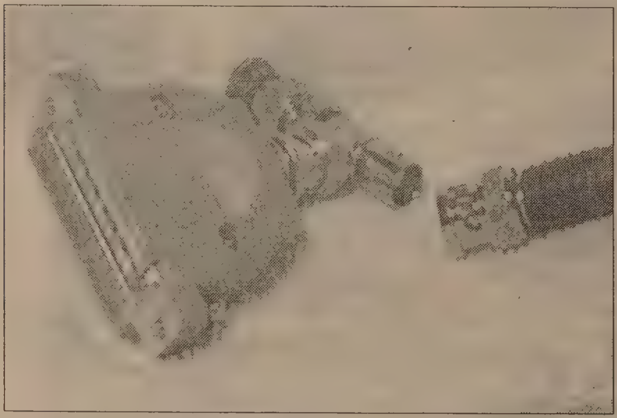


Networking The Amiga

AmigaLink Finds New Use For Floppy Disk Port

BY DOUGLAS J. NAKAKIHARA

Now even slotless Amiga models like the A500, A1200, and CDTV can be part of a network. Spectronics International U.S.A. is now shipping a terrific product called AmigaLink that allows Amigas to be networked using the floppy drive port.



Although networking usually in volves multiple users, single users can also benefit. Each step in the evolution of the Amiga has meant some incompatibility or another. As a result, many Amiga owners continue to hang on to older machines, even after purchasing a newer model. By networking the Amigas, peripherals can be shared, allowing maximum use of all hardware.

PARNET

Of course, many Amiga owners already rely on the freely distributable ParNet software to network Amigas. Like ParNet, AmigaLink is also a so-called peer-to-peer network because all of the nodes (i.e., networked computers) are equals, and any one of them can access another's storage devices.

However, as wonderful as ParNet is, it's just a toy compared to AmigaLink. A downside of using ParNet is that only two Amigas can be networked, while AmigaLink can have up to twenty. Furthermore, because ParNet monopolizes the parallel port, it can be a real pain to use other peripherals that require this port, like a printer, scanner, or audio digitizer. ParNet also provides no access security between nodes.

Although twenty is the recommended maximum number of nodes, that number can be exceeded, as can the recommended cable length limit of 330 feet. Apparently, the amount of interference at the network's location determines the actual maximum, but this can only be determined by trial and error. For example, using shorter cabling between nodes may allow you to link more than twenty Amigas.

INSTALLATION

Although the manual provides adequate

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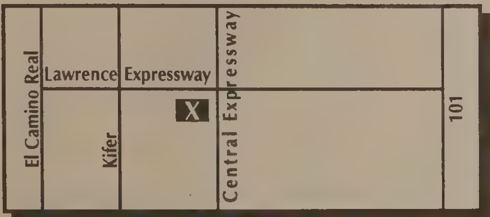

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10
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By networking the Amigas, peripherals can be shared, allowing maximum use of all hardware.

step-by-step instructions, they are spread over several chapters and the process takes longer than it should. Because installation is fairly involved, it would have been much better if the installation steps were consolidated and preceded by a brief overview of the procedures.

In spite of this, I had two nodes up and running in about one-half hour.

To install AmigaLink, you must first physically connect the computers. The petite AmigaLink adapter is basically a 23-pin connector with a BNC T-connector protruding from where a cable would normally exist. A removable terminating cap is attached to one end of the T-connector. AmigaLink will work with pass-through connectors, and you can still have up to three floppy drives on each Amiga.

Each Amiga must have its own adapter; 50-ohm RG-58 coaxial cabling is supplied. By removing the terminating cap, you can daisy-chain multiple computers together; however, there must be a terminating cap on the first and last nodes. The procedure is easy, and you don't even have to open a computer case!

The T-connector portion of the adapter is removable and you can disconnect or reconnect nodes without powering down. Connections will be reestablished once nodes are reattached. However, you should never add or remove an AmigaLink adapter while the computer is running.

The software is installed in three steps. First you must install the device driver on each Amiga. This is accomplished by clicking an icon and following the instructions. The manual provides detailed instructions on what AmigaDOS commands must be available for the installation script to work properly (e.g., Run, NewCLI, Copy, etc.). If the software is being installed on a floppy disk, you must delete some files to make room for the AmigaLink software. A handy list of deletable files is provided for Workbench 1.3 and 3.0 disks. Between the two, you can come up with a list for a 2.x Workbench disk. Obviously, you should use a copy of your original Workbench disk.

The second step is to install the file system software on each computer. Again, this is a click-and-go procedure. During this process you will be asked for a "host" name. Each node must have a unique name, like "Dougs4K," or "CDTV1." I'd recommend that you

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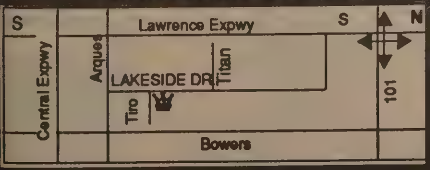

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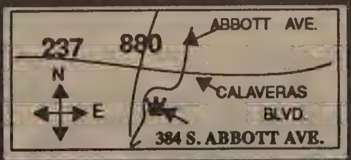

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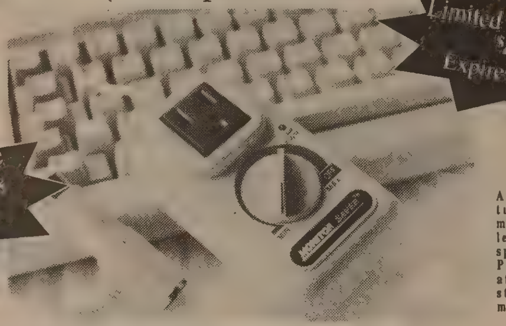

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keep names as short as possible for reasons you'll see later on. (I was surprised to find that the AmigaLink device driver is SANA-II compatible [Standard Amiga Network Architecture]. This means that ENVOY or other SANA-II compatible networking software can be used instead of the AmigaLink file system software.)

Once the device driver and file system are installed on all Amigas, the third step is to run the configuration programs on each node. These programs do not have to be installed on each node and can be run from the AmigaLink floppy disk. However, I found it more convenient to copy them to my hard drives for possible future configuration changes. There are two configuration programs: Import and Export.

> Spectronics is also considering releasing software to do simultaneous Lightwave rendering on multiple Amiga/Toaster systems.

Export allows you to identify which devices are available to other nodes. You can keep certain devices private and not allow remote access. This covers all storage devices including RAM: and removable media, like floppy drives (a disk must be present).

The Export settings can be saved as a default or just used for the current session. The settings file is saved in the ENVARC: directory under Networks. (ENVARC: is a standardized storage area for configuration information.) You can also save multiple settings.

Running the Import program brings up a list of the other nodes on the network, called "hosts." By selecting one of the hosts with the mouse, a list of all of its available (i.e., exported) devices appears. You can then select which devices should be mounted on this particular node. (Normally, the Export program should be run on all nodes before running the Import program.)

To avoid name conflicts, Import automatically appends the name of the host to the front of the device and volume names. (Remember, every Amiga storage device has both a device and volume name, which are usually different.) For example, the device and volume names "HD1" and "Work" on host "A3000" become "A3000-HD1" and "A3000-Work," respectively. So if a node already had a HD1 device called Work, a similarly named device on a remote node could be accessed without conflict. The default names can be changed, however.

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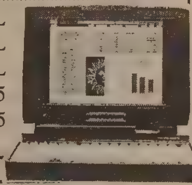

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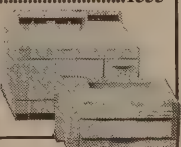

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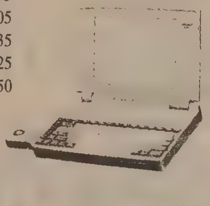

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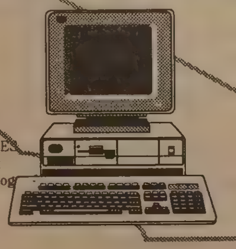

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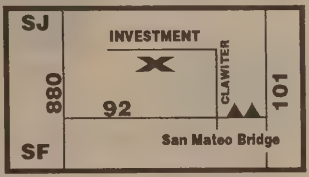

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The Import settings are saved in a file in the WBStartup drawer. Although this is a logical location, booting up without all nodes active will yield a slew of annoying error requestors. You can drag the Import icon out of the WBStartup drawer, but you'll have to move it every time new settings are saved. I remedied this by adding some lines to my Startup-Sequence that checks for the Import files in the WBStartup drawer and then moves them to another drawer. This works because the Startup-Sequence is executed before WBStartup programs are run. I don't know why the Import settings aren't saved in the ENVARC: directory just like the Export settings. This would allow the Import startup icon to be placed anywhere.

UTILITIES

Diagnostic utility programs are also supplied. One is a self-testing program which identifies hardware problems. Two other programs test the receiving and sending abilities of computers on the network. The Statistics program monitors and displays network performance information.

AmigaLink comes with a utility program called Spooler, which allows multiple nodes to use the same printer. Spooler is run on the node with the printer, referred to as a "print-server." The program monitors a user-specified directory for activity. When a file is completely "printed" to that directory, Spooler sends it to the printer port, usually PAR:, and then deletes the file.

All other nodes must run the AmigaDOS CMD command, usually found in the Tools or Utilities drawer. Generally, CMD is used to redirect printer output to a file in RAM:. However, the output it intercepts can also be redirected over the network to the monitored Spooler directory. You should be able to set up multiple print-servers, each running its own Spooler. Nodes could then print to any of these servers by simply changing the CMD redirection.

Do not run CMD on the print-server, however. Doing so will create an endless loop: CMD redirects data headed for the parallel port to the Spooler directory, Spooler then sends this back out to the parallel port—you get the idea.

OS1.3

Although AmigaLink was developed for OS2.0+ users, it functions fine using OS1.3 (reportedly even on an Amiga 1000). It's not as automated as under OS2.0+, so you'll have to use some CLI commands. However, you can modify your Startup-Sequence to automate the process. Remember to include the StartServer command, as the installation process does not do it for you.

MY NETWORK

My test network consisted of an Amiga 3000, 4000, and CDTV. The CDTV required using a pass-through external floppy drive. Since many external floppy drives, like the "official" black CDTV ones, do not have a pass-through connector, Spectronics will be releasing an inexpensive T-connector providing pass-through capabilities. An adapter for CD32 is supposedly in the works too. (Note: If you don't have a keyboard for your CDTV, there are a few public domain utility programs that emulate keyboard input using a mouse.)

I was extremely impressed with the AmigaLink. The network is professional and well implemented. Remote devices function just like local ones and their icons appear right on the Workbench, including "left out" icons (OS2.0+)! The network is virtually invisible. Here is where my earlier suggestion for short host names comes into play. Volume names that display wider than their icon will make for a real ugly Workbench! This is not a functional problem, but could become aesthetically annoying.

To network a CDTV, either have no CD inserted or make sure the CD is non-booting, so the unit will boot off the floppy drive. I was happy to find that AmigaLink handled changing the CDs. Although the volume name didn't change, I could still access it. To get the name to change you must unmount and remount the device.

continued on page 333

New Sounds From The Mac AV

Considerations Of Computer Acoustics

BY TONY REVEAUX

Copyright © 1994 by Tony Reveaux. All rights reserved. Tony Reveaux, a San Francisco-based consultant, writes the "MediaScan" column in Film/TapeWorld. He can be reached via Usenet (luna@well.sf.ca.us), AppleLink TREVEAUX, or MCIMail 290-3008.

Sound is an integral element of multimedia, and capabilities for recording, editing, manipulation, and playback are incorporated in computers more and more. In the PC/DOS sphere, one of the hottest peripheral markets these days has been for add-in audio cards such as Creative Technology's Sound Blaster and the models from Media Vision. Higher-end games and multimedia software products, all of which need deeper and stronger sound support, are driving this market.

The Macintosh has always had built-in sound, provided through an audio chip built into the motherboard. When the software calls for it, the 8-bit, 11kHz chip can support sound recording and playback, even acting as a four-voice digital synthesizer. With the Macintosh AV computers, though, audio really becomes native to the machine.

There, the 68040 CPU is joined by a 66MHz AT&T 3210 DSP (Digital Signal Processor), which provides such capabilities as Apple's PlainTalk speech recognition. With the optional GeoPort Telecom Adapter, it helps to support telecom, virtual faxmodem, and videoconferencing. For multimedia production, 16-bit stereo audio capture and playback with CD-quality sound manipulation is one of the AV's more stellar qualities. The ability to record direct to disk from the internal CD-ROM player in the playthrough mode is the kind of perk you can enjoy when full audio is native to the system.

AV'S SOUND

But all that sound will remain underutilized if the computer's audio playback cannot match the quality of the source. Along with the sound cards, self-powered speakers represent another growing market. Apple has matched the AV computers with its Power Speakers (around $150 street), a pair of external speakers, and the AudioVision 14 Display (around $680 street), which is one of the most advanced and interesting configurations of a monitor for multimedia.

The creative engineering behind these two products was provided by Howard Lieberman, now president of ESCAtech Media Inc. of Half Moon Bay. His background goes back to the Bose Corporation of Framingham, Massachusetts, designing OEM sound systems. When Bose started its relationship with Delco to build the sound systems for General Motors cars, he was involved in developing the measurement systems to design those complex molded speaker enclosures coiled beneath the dashboards of Chevys and Buicks. Later, he was brought into Apple as an acoustics consultant on the Macintosh AV system, then code-named "Cyclone." Within a short amount of time Lieberman found himself acting as head of Sound and Music at Apple Computer, where he supervised the development of all acoustical products. "I see sound as an engine that can emotionally engage people," he says. "Computers are mostly good at linear, rational intellectual kinds of exercises."

There were plenty of self-powered mini, or "bookshelf" speaker pairs around that Apple could have platinumed over to complete their product line. But these fairly efficient, low-cost systems have evolved from the boom-box stereo system add-on market to something designed to convey rock music at entertainment volume levels. Apple wanted speakers that were optimized for positions on either side of the computer monitor. They had to pump out high-efficiency curves at the lower levels demanded in workplace and classroom environments. Thus, the Power Speakers were designed and built from scratch rather than as a repackaging of consumer electronics products.

The AudioVision 14 Display is a gracefully logical configuration that integrates all the audio functions of recording and playback. Its sharp and clear 14" Trinitron CRT displays 640 x 480 vertical lines at 70 dots per inch. Built into its frame at the top is a directional microphone. The small twin speaker grilles are built into the lower face of the frame. Between them are the blatantly easy-to-use user controls for contrast, brightness, mute, volume, and microphone. Instead of diving for your mouse and scrabbling for the right icon on the screen, you can change the volume with a touch. At the sides are two ADB ports, one stereo line/mike input port, one stereo headphone/speaker output port, and one video-in port. Instead of using the hand-mirror-in-back-of-the-box trick to patch in the audio from an external device, I was able to plug them in in plain sight. A tilt-and-swivel base takes little effort to adjust. Add a camera, patch it into the video-in port, and you have an ideal platform for desktop videoconferencing.

COMPUTER ACOUSTICS

"The most important thing about these two kinds of products," says Lieberman, "is that there is a category of sound called 'computer acoustics,' which is in its infancy. This first generation of them did an okay job to start, but it can get a whole lot better."

The system benefits from extensive reality checks the designers made in confronting the conditions a user would experience while performing voice recognition, voice annotation, and videoconferencing. "That microphone and the [separate] microphone for the Quadra 840 AV both share very common goals," says Lieberman. "The reason for that depression in the frame topology is that when you want to speak to your computer there's a lot of noise pollution in the office environment. There is wave reflection when sound bounces off walls, which can confuse the CPU as it tries to filter out the extraneous information and tries to figure out what you said.

"I had the idea of making a very directional microphone that would cut out the reflections, by having a pressure gradient microphone in which the back wave, and the cardioid pattern of the front wave that are entering at certain frequencies, cancel. In the spectral domain we filtered out the low- and high-frequency noises that would not be in the speech band. It was hard to do because we had to use very inexpensive parts (for the manufacturing model). When the speech recognition team started working, they were using a $400 microphone. You can't talk to a computer if it doesn't have ears!

"The speaker designs for the two products are different. They both were created by two different vendors to my specifications, and two manifestations of the concept differed a little bit in terms of the spatial and spectral and dynamic aspects of the products. The one in the monitor was made by an American company, and the ones in the Power Speakers were made by a Far Eastern company. The bass response in the monitor is a little bit better, and the radiation pattern of the Power Speakers is a little bit broader. The speakers in the monitor are .7 watts and the Power Speakers are .5 watts.

"Neither one of them is very directionally designed; they were empirically tested for near-field sound. With the closeness of the two speakers in the monitor—9" center-to-center—you do get a tighter radiation pattern."

Why haven't other manufacturers built in speaker enclosures within their monitors? The speakers can perturb the monitor magnetically with the vibrations caused by delivering bass in a small enclosed space. Also, there are two kinds of monitors. The Sony Trinitron has an aperture grille, and the rest have shadow masks—membrane with holes.

The Trinitron's aperture grille is a grid of very thin wires that direct the electron flow, which results in a crisper, sharper image. "Since these fine wires are stretched across a pattern," says Lieberman, "they are shaken by the bass. There's a resonant frequency of that wire. So when you deliver a bass at such proximity, the picture moves. It was very hard for us to isolate the bass from making the picture move. And we did succeed, but we couldn't get as much bass in the box as we wanted to."

The one anomaly of the AudioVision display is the way that it connects to the CPU. Instead of a neat dock, a bulky, NASA-like multi-cable links the two units. Explains Lieberman, "We had felt that multimedia producers needed a 16" monitor for the Cyclone, which turned out to be the Quadra 840 AV, and at the same time we were trying to get the group of monitor people to talk to the group of CPU people so that the right connectors could exist on both units, so they could plug into each other.

"But they wouldn't agree. So, unfortunately the AV monitor was born and the AV Quadra was born in an incompatible way as far as the connectors were concerned. The code name for that product was 'Spaghetti' [the cable] and 'Meatball' [the connector]. I was really disappointed that management didn't think the monitor was a good enough idea to make a 16" one, or to continue the product line. Of the thirty-one guys involved in sound and music and in DSP, there is only one left." ■

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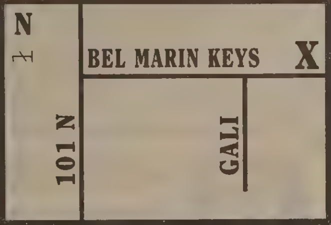

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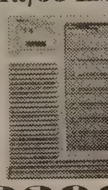

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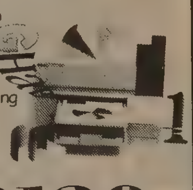

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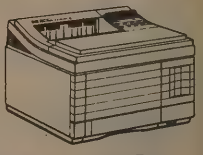

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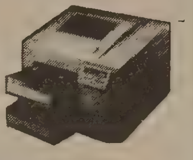

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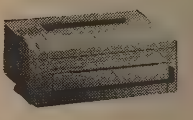

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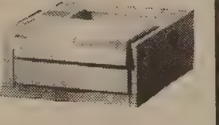

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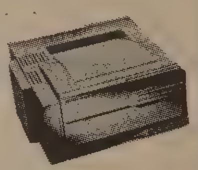

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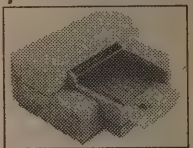

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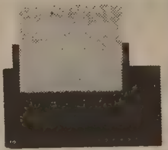

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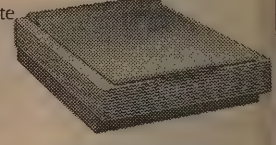

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Photojournalism And The Digital Imaging Revolution

How Photographers Can Benefit From Technology-Driven Change

BY JAMES A. SUGAR

Just as photographers struggle to pay their bills in recessionary times, the arrival of digital imaging threatens to change their entire industry. Unlike other technological innovations such as built-in light meters or fancy electronic strobe meters, which impacted only a small portion of the photographic process, the merger of computers and photography affects many photographers.

Some of us began making this change three years ago when Adobe introduced Photoshop 1.0 and Apple released the Macintosh IIfx—the first workstation-like machine which could handle the large files that Photoshop created. For me the interplay between the camera and the computer has represented a gradual change. Now I can move back and forth between each medium and pick the appropriate response—film or digital—in order to solve the client's needs.

With the arrival of Photoshop for Windows in December 1992, ducking the computer issue became a lot tougher to ignore. Yet photographers—and also designers—were faced with the need to make a significant investment in new equipment and new technology at the very time that their business was off by 20% to 50% compared to previous years. Mastering these new tools presented a significant learning curve. Expenses were up and income was down at the very time that future earning power was uncertain.

Like it or not, the arrival of digital technology has created a revolution in photography. At recent Photo East or Photo West conventions, digital technology was on display at nearly every company's booth and on every salesman's lips. Much as this generation of photographers might wish otherwise, technology won't stand still now any more than it did fifty years ago for users of 4 x 5 cameras who hoped that 35mm cameras would go away. While some photographers may not choose to take advantage of these changes, others will make their careers on these emerging technologies.

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Jim Sugar has worked as a contract and free-lance photographer for National Geographic *for the past twenty-two years. During the last two years he has combined his knowledge of photography and the Macintosh to teach a series of digital imaging seminars with photographer Dean Collins and illustrator Brian Lawler. He can be reached via email: JimSugar@aol.com.*

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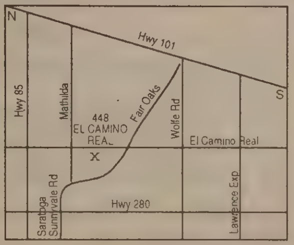

CHANGING WITH THE TIMES

While the American Society of Media Photographers may rail against photo buyers using clip art, it is impossible to hold back this technological tide.

An analogy can be made with the movie industry. Fifteen years ago, Jack Valenti, the head of the Motion Picture Association of America, testified before Congress in favor of a bill that would prohibit the rental of motion pictures on video tape. He argued that this new technology would destroy the motion picture industry. He was wrong. And fortunately for the motion picture industry, Congress rejected the bill.

Now that VCR's are as prevalent as televisions in American homes, the movie industry makes as much money from video tape movie rentals as from theater ticket sales. The new technology spawned a new industry.

A similar explosion will affect the arrival of digital technology to still photography. The digital revolution has arrived in photography. Get used to it. Take advantage of it.

KODAK IN TWO WORLDS

For some traditional photographers, for example, adjusting to change means nothing more than shifting from Kodachrome to Ektachrome if and when Kodak finally stops manufacturing the old standby.

But for the rest of us, the array of incredible new digital products and services introduced by Kodak alone during the past two years shows that even this most traditional photographic giant has invested heavily in a digital future.

On the one hand, Kodak clearly intends to continue selling film—although it may not always be Kodachrome.

But at the same time, Kodak's digital product line spans the full photographic process. Without ever venturing to the products of another photographic manufacturer, a photographer could produce filmless images on a DCS-200 camera or scan Kodak (analog) film into digital files using Photo CD. Once the image has been digitized and archived onto Photo CD, the file can be opened and modified using Adobe Photoshop software running on either a Macintosh or a PC.

Then the final product can be printed on Kodak's digital color printer, the XL-7720, or stored once again as an unchangeable, archived digital file on a writable Photo CD disk.

While Kodak may not manufacture either the computer hardware or the digital imaging software, "Big Yellow" wants to be part of your photographic future whether it involves film, digital technology, or some combination of the two.

In addition, Apple Computer now includes a CD-ROM drive as an integral part of many different Macs, thereby creating an installed base of CD-ROM drives that will surely help drive the success of Photo CD.

TALES FROM THE DIGITAL TRENCHES

So how does all of this affect photojournalism of the future? Let's look at two real-life examples from the recent past.

During the Russian revolution in the summer of 1991, the *San Francisco Examiner* sent photographer Kim Komenich to cover the events in Moscow. In addition to a camera bag full of Leica gear and Kodak Ektar film, Komenich also took to Moscow a Macintosh IIci computer, Photoshop, a scanner, and a modem.

After each day's shooting, he processed the color negative film at the AP's Moscow bureau, edited the negatives, and scanned the edited film into the Macintosh. Then after opening each image inside Photoshop, Komenich adjusted the contrast and brightness of each frame, saved the resulting digital file of each photograph, and then transferred the files via modem and telephone line, first to London and then on to the *Examiner*'s office in San Francisco. At the *Examiner*, editor Chris Gulker opened the files, selected and cropped the final frame, and placed the photograph in the newspaper.

Four hours after he'd shot the photographs on the streets of Moscow, the *Examiner*'s presses in San Francisco were printing newspapers containing Kim Komenich's photographs from half a world away.

In this case, the Macintosh running Photoshop acted as a valve, that is, as a means to translate the analog image of a photograph into a digital file that could be transmitted via a telephone line. Komenich did not use Photoshop to alter the reality captured by his camera. Rather, he used the computer as an electronic medium to transmit the photographs and to make the world a little more understandable to the *Examiner*'s readers.

A second example:

Before Bill Clinton made his victory speech on the steps of the state capitol in Little Rock, Arkansas, on November 2, 1992, the press had erected a wooden stand near the capitol's steps so that pool photographers and video crews could record the event.

The Reuters news agency installed two secret weapons to quickly record and transmit photographs from this late-night event. In addition to using a Kodak digital DCS 200 camera attached to a standard Nikon 8008 camera, their photographer attached a computer cable to the camera that was also connected on the other end to a Macintosh IIci and operated by an editor seated underneath the wooden photo stand. The Macintosh, in turn, was connected to a modem and a phone line via the computer's serial port.

As the photographer made each exposure, the image showed up via the DCS 200 software three seconds later on the Macintosh screen located six feet underneath the platform. The editor could edit the images in real time and then transmit the selected photographs just moments later via the modem. Within minutes of shooting the photographs, subscribers to the Reuters news service received images via a digital camera.

Whereas Kim Komenich exposed and processed negative film that was scanned before being transmitted, the use of the Kodak digital back by the Reuters photographer involved no film. Here the Kodak DCS-200 acted not only as a camera but also as a scanner. Creating the image meant the creation of a digital file inside the computer.

Because of the speed of the process and the elimination of interim steps such as film processing and scanning, still photography could almost compete with television in terms of the speed of transmission of the image. Obviously a paper still must be printed and delivered to its customers. But Reuter's use of a digital camera at this 2 am EST event accelerated the process of delivering a photograph that ran on the front page of morning newspapers across the United States and beyond just a few hours later.

For those photographers who thought the arrival of the Photomic head on the old Nikon F marked a profound change, this brave new world of ones and zeros represents absolute chaos. But for others, the changing photographic universe represents a host of new possibilities and opportunities. ■

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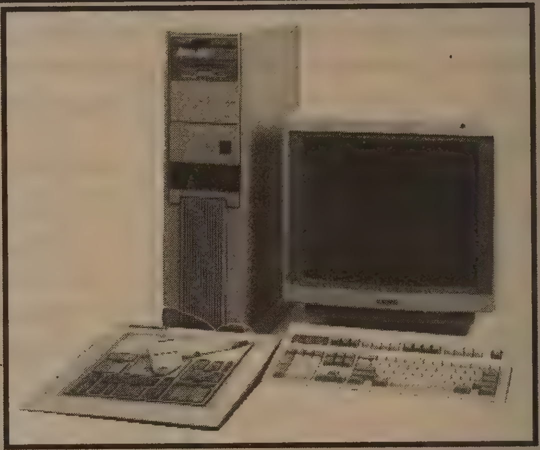

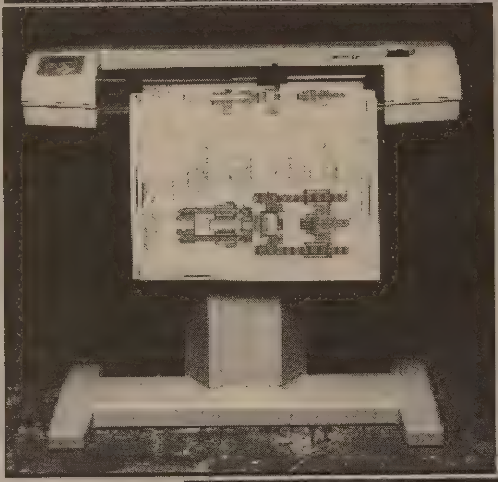

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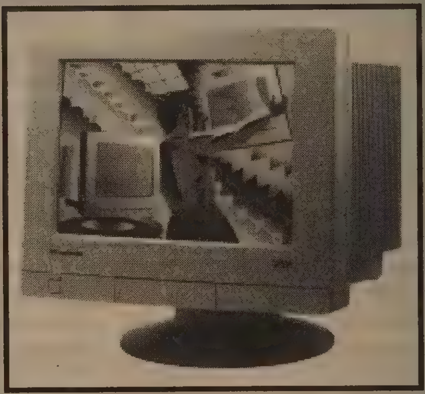

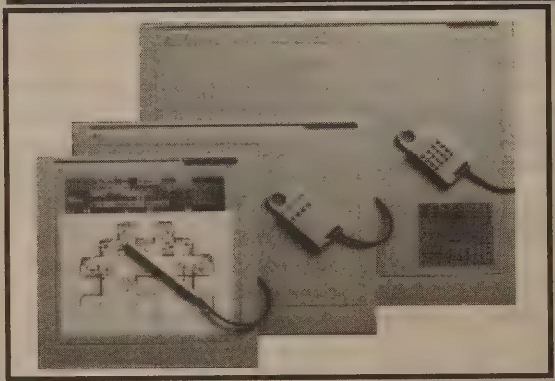

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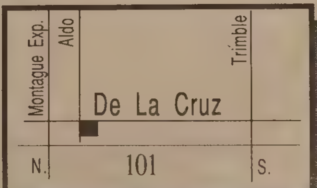

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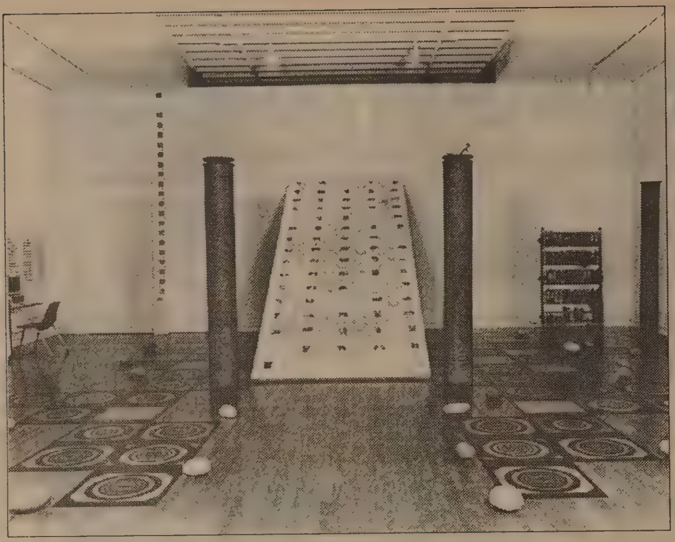

Sonya Rapoport. Shoe Field, an interactive installation. Photo taken at Richmond Art Center.

Interactive Installation Art

Blurring The Lines Between Artist And Audience

BY JUDY MALLOY

Installation art can be thought of as a kind of sculpture that is related to the environment in which it is installed. Whether an artist integrates computer technology into their work or not, installation art contains the elements for cultivating the active relationship between art and audience that is sometimes called interactivity. It presents a natural and diverse form for art to assimilate the computer's capacity to absorb audience input and respond.

Because of its relationship to the surrounding environment, viewers typically enter an installation rather than simply looking at it. For example, viewers who visited Reiko Goto's installation *Nezuki* at the San Francisco Art Institute several years ago found themselves inside a human-sized rat cage. Rather than merely observing a painting or sculpture of caged rats, the visitor experienced a caged rat's environment.

Installation art uses sculptural space to locate the viewer within the work. By adding computer processes, interactive installations like Sonya Rapoport's *Shoe Field*, Steve Wilson's *Is Anyone There?*, *Matrix: Women Networking* (a collection of women-centered online interactions organized by Anna Couey and Lucia Grossberger Morales), and Gene Cooper's *Secret Interactions* further involve the audience. In these works, the viewer is not only actively located within the work, but also becomes a participant who takes part in the process of shaping the work.

Interactive installations can also "connect" viewers either by asking them to set responsive processes in motion (Tim Anderson's *Tissue Mobile*; Jacquelyn Ford Morie and Mike Goslin's *Virtopia*) or because their physical presence triggers some kind of action. (David Gaw and Ed Koch's *The Fence*; Joel Slayton's *Telepresent Surveillance*.) In all these works, as in all interactive installation, the audience is asked to go beyond what Steve Wilson, a San Francisco State University art professor, calls the "passivity of much art appreciation."

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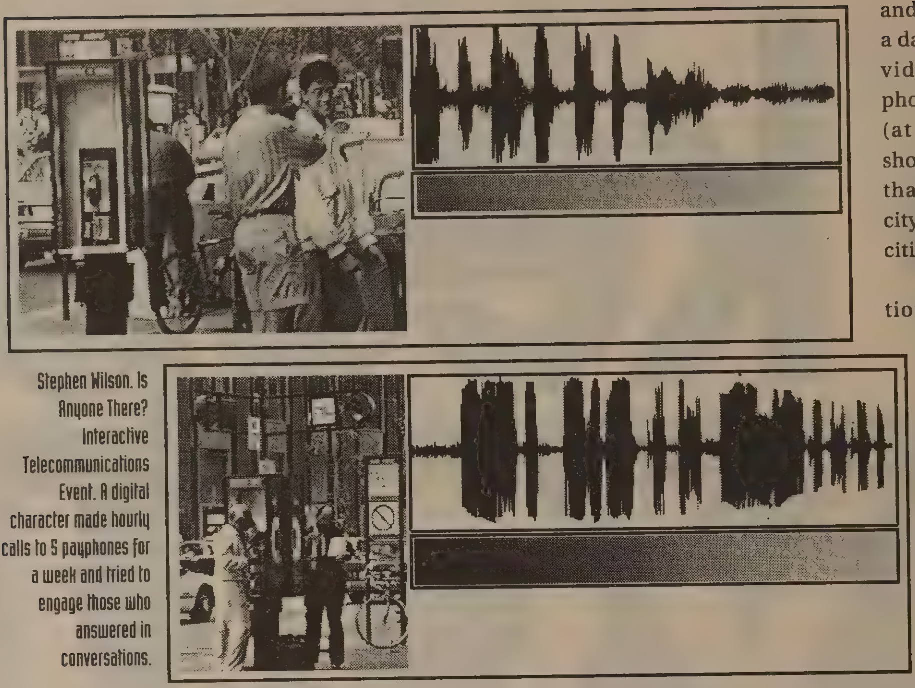
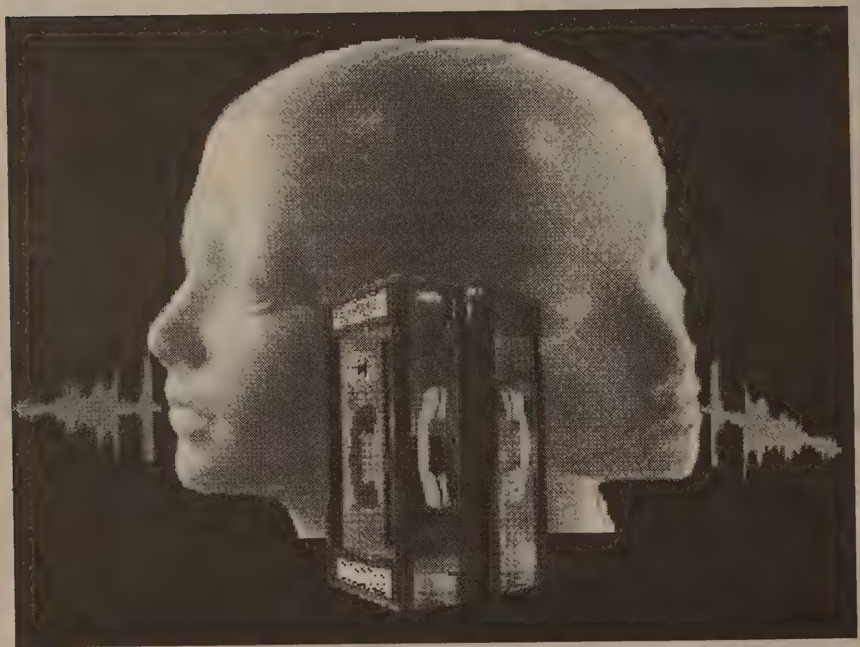


Stephen Wilson. Is Anyone There? Interactive Telecommunications Event. A digital character made hourly calls to 5 payphones for a week and tried to engage those who answered in conversations.



Stephen Wilson. Is Anyone There? Interactive Telecommunications Event. The digital character used both male and female voices for its calls to San Francisco payphones.

IS ANYONE THERE?

Wilson has been integrating computers into his installation art since his *Interactive Theatre* at the Art Institute of Chicago in 1981. His current work *Is Anyone There? A Voice Activated Tour of San Francisco Via Its Pay Telephones* appropriates, he says "the often intrusive computer-based telemarketing technology and uses it in a new way, involving people who don't traditionally participate in the art world."

Wilson began *Is Anyone There?* by having a computer telemarketing device make hourly calls to selected pay telephones in locations throughout San Francisco—such as North Beach, China Town, the Financial District, the Civic Center, and Haight-Ashbury. Passersby who picked up ringing phones in these areas were asked questions about living in the city. Using a Mac II, HyperCard, and Voice Navigator, he incorporated a database of these recorded calls plus video footage of scenes near the phones into an interactive installation (at the annual computer graphics show SIGGRAPH among other places) that allowed viewers to explore the city through comments by their fellow citizens.

When a viewer at the installation displays a lot of interest in an area, live phone calls are automatically placed to pay phones in that area. If, for instance, a viewer consistently asks the database for information about North Beach, he or she triggers a real-time phone call (audible in the installation) to that area. Thus viewer actions partially shape the experience of *Is Anyone There?*

"WHERE DID YOU GET THOSE SHOES?"

Because of their capacity for information gathering, it is natural for interactive installations to span several years as each installation generates material that is replayed and built on in successive installations. In addition, interactive installations often blur the lines between artist and audience by involving audiences outside the bounds of traditional galleries and museums.

Interactive installation pioneer Sonya Rapoport began *Shoe Field* (her 16-year long series of interactive installations about the shoes people wear) at an event called "A Shoe-In" at the Berkeley Computer Center in 1982. People who entered the store were asked questions about the shoes they were wearing. "Where did you get those shoes?" "Why did you buy them?"

The evening I visited this installation, I was wearing boots I bought at the Salvation Army for a trip to Boston. I remember responding with this information and observing that it was typed into a simple computer database. Like everyone else who participated in this event, I also had my shoes photographed as I placed them on a stand in the computer store. What I chose to place my feet on and how I placed them was also recorded on the computer.

Using an MS-DOS computer, Rapoport fed the data gathered from the seventy-

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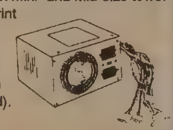


A. "Mini-tower" power supply, fits most Mini- and Mid-size tower cases as well as many small-footprint desk-top cases. 200W, measures 6" x 5.5" x 3.5", has normal motherboard connectors, three large and two small drive connectors and 22" long switch connection leads (switch not included). New! **HSC# 14649 $27.50**

B. "Mini-tower" power supply, same as above but 165W and 10" switch connection leads. New! **HSC# 14632 $24.95**

C. 386SX Motherboard, small footprint (8.625" x 8.625") 25 MHz with five 16-bit slots, two 8-bit slots, AMI Bios, AMD processor, room for 8MB SIMM RAM's (0K installed), socket for 80387SX. Brand new in box, manual, 90-day warranty. **HSC# 14666 $49.00**

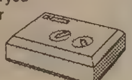
D. Used, good condition 3.5" Half-height 720K Floppy disk drive, Teac FD-135HFN-411-U. Hurry, 720's are getting hard to find! 90-day warranty. **HSC# 14668 $19.95**

E. Used, good condition 5.25" Half-height 360K Floppy disk drive, Teac FD-55BV-11-U. Hurry, 360's are getting even harder to find! 90-day warranty. **HSC# 14667 $14.95**

F. Generic Mouse – three-button mechanical mouse for 9-pin "D-sub" type serial interface. New OEM version (sorry, no book, software or fancy box), 100% Microsoft Compatible. **HSC#14673 $4.95**

G. Everex Mini Magic Card EV-138 -- adds 576K RAM to your PC or XT (RAM Chips not supplide), new in box. **HSC# 14593 $4.95**

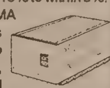
Give your Mac Vision!



With MacVision (and a video camera) your Macintosh will be able to see the outside world! Capture video stills from any composite video source (camera, VCR, video disk) and you can commit a B & W image to a disk file for editing with your paint program. New in the box unit with cables and power supply. Works with Mac II, SE or Plus, System 4.1+

HSC# 80150 $39.95

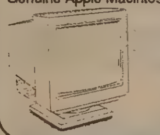
Computer Protection...



Better protection than a surge suppressor! These Sola MCR500 voltage regulators regulate line fluctuations of ± 15% to within 3%. Provides 500VA of sinusoidal output within NEMA voltage specs with an input voltage as low as 65% of nominal! Surge suppressors can't *raise* low voltage in brown-outs! Filters out spikes, noise and other transients, and isolates load from power line. Used units, 40 lbs., 17" x 8.5" x 8.5", four AC outlets, heavy line cord, circuit breaker. **HSC# 14642 $95.00**

Mac Color Monitor

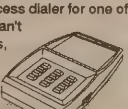
Genuine Apple Macintosh Performa 14" color monitor features:



- ⌘ .39 dot pitch
- ⌘ 640 x 480 picture resolution
- ⌘ 67 Hz vertical refresh rate (no flicker!)
- ⌘ Tilt/Swivel base
- ⌘ New in box with cables, instructions
- ⌘ 90-day warranty

HSC# 80149 $179.95

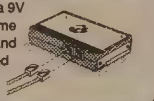
One-trick Phone Friend



This little novelty was meant as an easy-access dialer for one of the off-brand long distance services. You can't change the pre-programmed access codes, but it will remember the last number you dialed with it, so you could use it as a one-number (16-digits) memory re-dialer. Handy for those midnight overseas calls! Uses three button cells which might need replacing.

HSC# 14438 $4.95

Multi-use Mini-modem



New lower price on the PCI **Travelcom** "pocket" modem shown below. This tiny (2.75" x 4.75" x 1") gem is perfect for laptops on the go! It communicates at a rapid 9600 bps (V.32) with MNP error correction, and will run for 2 -3 hours on a 9V battery. These are new in the box, come with a manual, AC Adaptor, telco cable and two serial adaptor cables (one for IBM and one for Mac), as well as your first battery!

HSC# 14583 $69.95

Unusual Wire for RF Work

Strange wire you are unlikely to find at your usual sources...tiny bifilar wire. We are talking small! This two-conductor enameled wire is used for winding RF matching transformers and other exotic induced-voltage applications. The two color-coded conductors are each 0.08 millimeters dia. (looks like a hair!) and can be pulled apart (carefully!) and solvent-stripped for solder connection. 720 meters on a roll. Tiniest wire pair we've seen.

HSC# 14376 $7.95

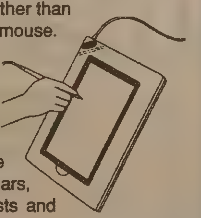
Hard Disk Full? Put the Squeeze on your Data with SuperStor!

There are thousands of ironic stories in Software City, this is only one of them... Before Microsoft came out with DOS 6.0, there were dozens of thriving software companies writing all sorts of useful DOS utilities, including several varieties of Data Compression utilities. One company, Addstor, had a pair of products called SuperStor 2.0 and SuperStor PRO, which were finished, functioning, mature products. Giant Microsoft released DOS 6.0 with a data compression utility included, and Addstor saw their market evaporate. They eventually went under. The irony? DOS 6.0 had problems in the data compression utility, which required the birth of DOS 6.2...at the same time, a lawsuit by another utility provider against Microsoft was upheld, which we hear means that DOS 6.2's data compression utility may not be included anymore! Where does that leave Addstor? Still defunct, we're afraid, and no longer offering support, but we bought the remaining stock of their SuperStor and SuperStor PRO packages, and offer them at these amazing prices!

A. SuperStor 2.0 will increase your disk capacity, defragment files, and make better use of your disk space. Need DOS 3.2 or later, not compatible with Zenith or Tandy DOS. HSC# 14674 $6.95

B. SuperStor PRO includes Windows-based JPEG/MPEG compression/expansion utility for .JPG, .BMP, .TIF, .TGA and .PCX graphics files (huge benefits, 20:1 compression typical!), Windows utilities, increased compression and speed over SuperStor 2.0, password protection, Tune-up Analyzer, Integral Disk Cache, Compression Preview, automatic transparent data compression, more! HSC# 14675 $14.95

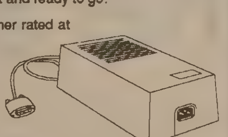
Natural Drawing on your Computer!



Have you ever tried to draw something with your mouse in any paint or draw program? It is nearly impossible to sketch anything other than the simplest geometric shapes with the ordinary mouse. Trackballs are even worse. They are great pointing devices, but as artist's or designer's tools, forget it! That is where graphics tablets or sketchpads take over. Calma and Summagraphics, to name two of the larger players, have made their name in this area, and no CAD user is going to be without one of these precision tools. They also can cost several hundred dollars, which takes them out of the range of most hobbyists and "thumbnail sketch" artists. Now you can move up to this technology without becoming a starving artist! The "PenMate" by Mouse Systems has a 6" x 9" drawing surface (that can be used in either "tall" or "wide" orientation) with 1000 lpi resolution that uses a pen-type stylus for position input, and a pressure tip and finger button which emulate the mouse buttons. Included software installs "Windows for Pen Computing" (you must already have Microsoft Windows 3.1) so you can experiment with handwriting recognition, and PenMate utility software lets you access frequently used Windows commands with just a touch of your pen. Mouse Systems' PenMate is 100% compatible with Microsoft mouse and Summagraphics MM Series graphics tablet protocols. And you get all this for only $39.95? Wow, get sketching today! **HSC #14672 $39.95**

Power Supply Project Starters

Nearly any electronic project you do these days is going to need 5, 12 and -12 voltsin order to wake up and dance, so here are some handy powersupplies already built and ready to go:

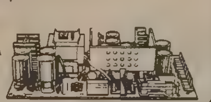


A. Enclosed supply (illustrated at right) has small Astec switcher rated at 5VDC @ 3A, +12VDC @ .65A and -12VDC @ .15A in a case measuring 4" x 6.5" x 2.5" with a DE9 female plug as the output. Uses standard IEC line cord (not included). Wired for 220 VAC input, we show you which jumper to move for 110 operation. Remove it from the case and it is similar to "C" below.

HSC#14579 $9.95

B. Open frame Protek switcher, new, similar to illustration at right, below.
110/220VAC input, 5VDC @ 3A, 12VDC @ 2A, -12VDC @ .3A output. Measures 3" x 5" x 1.5"

HSC #13728 $14.95



C. Open frame Astec switcher, new, similar to illust. at right.
110/220VAC input, 5VDC @ 2.5A, 12VDC @ 2A, -12VDC @ .1A
Three output connectors for 3.5" disc drives. Size 4" x 6.25" x 1.75"

HSC #14483 $19.95

CD-ROM Bundle Blowout!

How do they get so much data on such tiny disks? This collection of seven CD-ROM disks contains a complete World Atlas by Software Toolworks, the complete Software Toolworks encyclopedia by Grolier, the Microsoft Bookshelf package with helpful writer's tools such as a Dictionary, Thesaurus, World Almanac/Fact Book, Bartlett's Quotations, the Chicago Manual of Style, Houghton Mifflin's Spelling Verifier and Usage Alert, US Zip Code Directory and Business information sources. Another disk holds the Microsoft Small Business Consultant and Stat Pack with loads of valuable financial, statistical, and management information. There is a disk that has a large database covering music CD's, complete with reviews, music samples and cover art, and a player that will let you play music CD's in your computer's CD-ROM! Yet another disk contains Hot Line, a telephone management system that contains a US phone/address directory and call management tools that let you build your own databases for telephone contact maintenance. As if that weren't enough, a game disk is included with ten games, including Black Hole, Hunt for Red October, a 3-D game with special glasses included, and more! You've seen these bundles advertised elsewhere for over $100, but you can get this 1990 set for only $39.95! Installation disk, CD menu system and manuals included. HSC# 14670 $39.95

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1. **Everex Evercom II-24 Modem for PS/2** – MicroChannel Bus internal modem, 2400 bps, new in box, fully Hayes compatible, comes with free Bit-Com software (3.5" diskette), Compuserve offer, manuals, telco cable. Pull onto the Information Superhighway, don't be left in the dust! HSC#14591 $19.95

2. **Everex 2400 Baud Modem PC Board** (RS-232 external type) 3.25" x 6", no enclosure available, Hayes compatible, new, fully assembled PC Board, works great with ProComm, requires 8-12VDC power adaptor (we have one you can adapt for this). Data sheet & pinout incl. HSC# 14467 $8.95

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Some younger enthusiasts may find this hard to believe, but hobbyists of yore actually used to get excited over finding circuit boards with interesting parts to unsolder! We're hoping there are still some people who appreciate this practice because we have some RF Network boards that have gobs of neat stuff...two Motorola MC145156P1 Synthesizer Chips, three Mini Circuits Labs SBL-1 Balanced Mixers, four VHF High-band Bandpass Filters, three SL560C 300MHz Lo-noise Pre-amp IC's, an FM Detector section built around an LM3089, a 3N211 FET, lots of Toko adjustable coils, etc. HSC# 14581 $4.95

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two participants at “A Shoe-In” into a field theory program that calculated and organized it in diagrammic form. The idea, Rapoport says was to see if “qualitative data would reveal quantitative information about people.” Over several years, with the help of several programmers (Eric Wickner, David Rapoport, Scott Morris), a *Shoe Field* was developed. Through a complex system based, among other things, on how interactive participants were with their shoes, an ASCII graphic of the event was printed out that showed the relationship of the shoe respondents to each other. In addition, she developed the capacity to print out individual “shoe fields” so that in future installations, participants could receive personalized printouts.

In an interactive installation at Media in San Francisco, 1986, the photographs taken at the Berkeley Computer Center and the *Shoe Field* printouts were incorporated into a new series of computer-based questions and answers that further shaped *Shoe Field.* Participants in the Media event actually sat down at a computer, typed in their responses and went home with individual shoe field printouts. Every participant’s response became a part of the total data that continued to shape *A Shoe Field.* Thus, *A Shoe Field* was a fully interactive series of works. The information that participants provided was incorporated into the work itself.

“A POPULIST ELECTRONIC TOWN HALL” ON THE INTERNET

The Internet and other online systems with their large, diverse user bases are ideal venues for broadening the audience of interactive installations. At SIGGRAPH 93 in Anaheim, California this fall, *Matrix: Women Networking,* coordinated by Anna Couey and Lucia Grossberger Morales, was a room-sized installation containing interactive works by six women artists from different cultures and backgrounds.

Matrix included an online artists book about an intergenerational community history project by Aida Mancillas; NAPLPS graphics by Lorri Ann Two Bulls (Oglala Sioux); an online poetry slam organized by Lisa Cooley; and a virtual town hall by Anna Couey. Visitors who entered *Matrix* were engaged by these works and asked to respond in various ways. In addition, many of the works included in *Matrix* were read and responded to by Internet users all over the world.

Couey, the Network Coordinator for Arts Wire, an artists’ BBS, describes her own work “Imagining the Information Age” as “a populist electronic town hall informed by culture, politics, economics, theatre, experience, and dreams.” “Imagining the Information Age” elicited and incorporated responses from participants from four nodes: high school students in immigrant communities in San Diego; Women’s Information Retrieval & Exchange (WIRE); Arts Wire; and visitors to SIGGRAPH 93.

Each node developed an “ideal” political representative—in Couey’s words: “a

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virtual fiction that may have the power to bring dreams to life in the Information Age." The San Diego node's representative was Ms. del Campo, an activist for at-risk children and families. The fictitious Ms. Del Campo was an educator, who followed technological developments and worked with at-risk children. "We have selected Ms. del Campo as our representative because of her persuasive abilities and her success in working with people from all areas of society—neighborhoods, corporate and government entities, and the public school system," the participants emailed to *Matrix: Women Networking*.

WRITE ABOUT A SECRET

At the IDEAS Festival in Telluride this summer, Arizona State University graduate art student Gene Cooper installed a system for gathering viewer secrets called *Secret Interactions*. On a series of computer monitors and keyboards, participants anonymously typed in memories, secrets, accidents, and stories that were transmitted via modem or cable to another location where they were displayed on a computer monitor.

On the keyboard at the Electronic Cafe outpost in the basement of the Sheridan Hotel, I typed in a series of secrets about peanut butter and violin lessons. I was unable to see what I typed, but my words showed up at another monitor in the Golden West Gallery where viewers saw my words but had no idea who wrote them. Conversely, words typed in on the keyboard across town at the Golden West Gallery showed up on the monitor at the Electronic Cafe site where I was sitting.

Secret Interactions is a continuing work—started as a part of Cooper's installation *Rupture* at the Left Bank Gallery in Kansas City, Missouri in April, 1993. "What I'm trying to do, in a nutshell, is give the viewer/participant a larger level of control over the installation than the artist himself. To let them mutate it, change it, bring content and form to it, etc. Basically put me out of a job so to speak," Cooper wrote me via electronic mail. "What that leaves me with is a challenge to create a web or system in which this can happen (in an art context, such as in a gallery, or alternative space). I don't think interactive is the right term for this anymore, have any clues?"

"WHO HAS TO WATCH THEIR LUNCH MEAT DIE?"

Levels of interactivity and the vocabulary of interactivity are subjects of heated discussion in computer art circles. Although many artists agree that works with buttons or other devices simply triggering abstract responses—lights flashing on or off, etc.—is not really interactive, just how interactive the art is may not be as important as

RESOURCES:

Is Anyone There?
Steve Wilson
Conceptual Design Area
Art Dept.
San Francisco State University
San Francisco, CA 94132
Email:
swilson@sfsuvax1.sfsu.edu

Matrix: Women Networking
Anna Couey
1077 Treat Ave.
San Francisco, CA 94110
Email:
couey@well.sf.ca.us

日本語でＰＣしませんか？
日本、アメリカの皆様への日本語ＰＣサービス
Multimedia System　ＣＤを見よう！

Economy Class 松 $1,684
i486DX33, 128k chache, 4MB, 170MB, ET4000 ISA w/1MB, 1.44FDD, Mouse, 101 keyboard, Super I/O, 14"SVGA Monitor, Mitumi CD-Drv Double Speed 250ms, Sound Blaster 16bit Basic, Case w/speaker

Business Class 竹 $2,243
i486DX33, 256k chache, 8MB, 340MB, Cirrus5428VL w/1MB, 1.2&1.44FDD, Logitech Mouse, 101 keyboard, Super I/O, 14"NI SVGA Monitor, Toshiba CD-Drv Double Speed 200ms, Media Vision Pro Audio Spectrum 16, Adaptec 6360 VLB-SCSI 2, Case w/speaker

First Class 梅 $2,680
i486DX2-66, 256k chache, 8MB, 540MB, Diamond Stelth24 VL w/1MB, 1.2&1.44FDD, Lohitech Mouse, 101 keyboard, Super I/O, 15"VESA Monitor, Toshiba CD-Drv Double Speed 200ms, Media Vision Pro Audio Spectrum 16, Adaptec 6360 VLB-SCSI 2 Case w/speaker

日本語へアップグレードしませんか？

Economy Class 松 $1,520
i486DX33, 256k chache, 4MB, 170MB, Cirrus5428VL w/1MB, DOS 6.2/V, Windows 3.1J, Winword 5.0A

Business Class 竹 $1,799
i486DX33, 256k chache,8MB, 340MB, Cirrus5428VL w/1MB, DOS 6.2/V, Windows 3.1J, Winword 5.0A

First Class 梅 $2,219
i486DX2-66, 256k chache, 8MB, 540MB, Diamond Stelth24 VL w/1MB DOS 6.2/V, Windows 3.1J, Winword 5.0A

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CPU	486DX33 $265 486DX2-66 $440	FDD	Mitsumi 1.44 :$33 TEAC 1.44/1.2:$78
Motherboard	VESA 256K $125	HDD	340MB IDE :$265 540MB IDE :$420
Video Card	Cirrus 5428 VLB w/1MB		:$95
	Diamond Stealth w/1MB		:$142
Mouse	Logitsc OEM Serial 2 Btn		:$25
Keyboard	Maxi Switch 101: $35, Japanese 8020		:$99
CD-Drive	Toshiba Double Speed 200ms		:$335
	NEC OEM Triple speed 180ms		:$499
Monitor	MGC 15" .28 VESA		:$335

アメリカ話題のＣＤタイトル：　超特価

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Hell Cab	$67	Lovely Lady II	$39
MS Dinasaur	$55	House of Sleeping Beau-ties	$55
MS Cinemania	$55	--New!!--	
Jazz History	$49	Scissors N Stones Intera-ctive(Yakyu-ken)	$60
Compton's Interactive Ensycropedia(OEM)	$65		
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P5-66 Pentium 256K w/3VLB	$1318	$1733	$1926	$1954
P5-60 Pentium 256K w/3VLB	1130	1533	1726	1754
GREEN PC 486DX2-66 256K w/3VLB	495	922	1127	1165
GREEN PC 486DX-40 256K w/3VLB	345	777	982	1020
486DX2-66 128K w/3VLB	455	878	1080	1108
486DX-40 128K w/3VLB	305	705	896	1034
486DX2-66 128K w/VLB	445	868	1061	1089
486DX-40 128K ISA	300	695	896	938
486DX-33 64K ISA	256	652	852	890
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whether or not it "works." The real question may be "Does it connect with the viewer—engage the viewer in a meaningful dialogue?"

For instance, Tim Anderson's computer controlled *Tissue Mobile*, a blob of muscle tissue suspended in a large glass jar, uses a simple button-style kind of interactivity, but the content of the work actively challenges and "connects" the audience. When you push a button marked "push me," the muscle convulses.

"I want to make the viewers the torturers or murderers of this creature.... Who has to watch their lunch meat die?" Anderson, a researcher at MIT's Laboratory of Manufacturing and Productivity, asks in the catalog for *The Computer is not Sorry*. (The show was at Boston's The Space, where *Tissue Mobile* was installed in January 1993.)

DISINTEGRATING BABIES

The kind of interactivity used routinely in software (where users follow paths determined by the information they input) can also be incorporated in installation situations. This kind of interactivity is particularly adaptable to the latest in interactive installations—virtual installations. Although the user is not actually shaping the work as a whole, in these installations, he or she is shaping the individual experience of the work and through a hands-on process is connecting to the work in an interactive way.

For instance, In *The Virtopia Virtual Reality Project*, conceived by Jacquelyn Ford Morie and Mike Goslin, of the Visual Systems Lab at the Institute for Simulation and Training, in Orlando, Florida, viewers choose between several virtual rooms. In the Baby Room, texture mapped polygons simulate gurgling, crying, or quiet babies. The viewer can pick up the babies and move them around a room that contains baby associated furniture such as cribs, playpens, and child-size chairs set up for a tea party.

Moving the babies sets off chains of events—babies may disintegrate or grow into instant adults, for instance. "Several babies placed at the tea party table may break into a babbling conversation which gradually becomes more and more understandable, until it becomes an adult conversation about finances, or taxes, or some other boring topic," Morie says. *Virtopia* runs on a Silicon Graphics Reality Engine with Sense8 software, and uses a Virtual Research Head Mounted Display, a Polhemus Fastrack, and the Convolvotron 3D sound system.

AN UNDULATING BOUNDARY

San Francisco artists David Gaw and Ed Koch refer to their work as "coactive" rather than interactive. "We seek to achieve behavior in the object that permits the viewer to perceive his or her influence on the object and the object's inherent behavior without understanding the nature of the influence," they wrote about their coactive installation *The Fence* in the 1993 SIGGRAPH catalog.

The Fence is an actual picket fence divided into hinged sections that moves and undulates in response to people in the room. It is intended to stimulate the audience to consider boundaries and the effects of changing boundaries in contemporary society. "The real power of the computer as an artistic medium rests in its ability to respond in real time to events in the world," Gaw and Koch believe.

> "The real power of the computer as an artistic medium rests in its ability to respond in real time to events in the world."
>
> —David Gaw

"COMPOSING INTEGRATED EXPERIENCES FOR THE AUDIENCE"

Joel Slayton's Interactive Installation *Telepresent Surveillance* (Systems Software Design and Programming: Kelvin Chan) also responds directly to the viewer's physical presence. In *Telepresent Surveillance*, an automated surveillance system that includes a helium-filled inflatable object that hovers on the ceiling of the installation. Mimicking military surveillance systems, it locates moving targets—in this case, viewers who enter the installation. The inflatable object follows its target around the room until "it gets tired... returns to the ceiling, powers up, and looks for a new target," says Slayton, an art professor at San Jose State University.

Slayton believes that "interactivity processes are at the heart of the digital media experience. I think of interactivity as a dynamic and changing sequence of nonlinear events that define the relationship formed with information events," he says. "Combining interactive processes with technology for simulation, information distribution, and multimedia display provides a means for composing integrated experiences for the audience." ■

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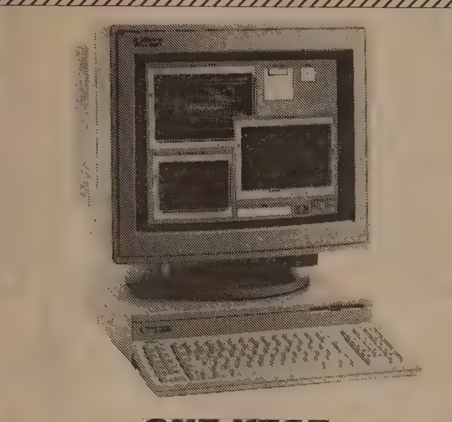

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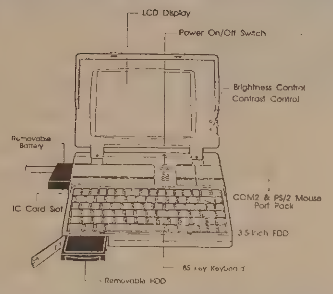

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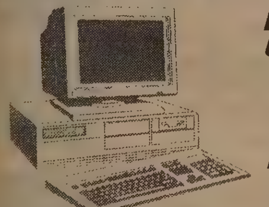

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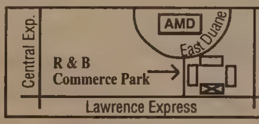

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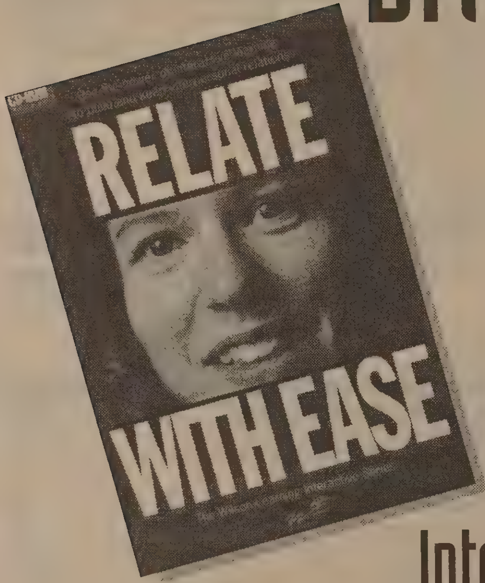

Wilson Learning Repurposes Its Interactive Business Training Videodiscs Onto A New (More Affordable) Medium

BY CHRIS OKON

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Chris Okon is a San Francisco-based writer and consultant specializing in multimedia networked applications. She is the coauthor of Demystifying Multimedia *(published by Apple Computer and vivid publishing) and teaches at San Francisco State University's Multimedia Studies Center.*

When it comes to employee training, most business owners face a paradox: how to maintain productivity without losing money and time. To send even one employee to a seminar can be costly, especially after tallying up the fees, travel, and per diem expenses. And if that employee leaves the company, the cycle begins again. To many large corporations, such a dilemma is a fact of life. To many small businesses, however, training is a luxury.

Large corporations have long regarded computer based training (CBT) to be a cost-effective way to educate employees on everything from effective sales techniques to heavy machinery operation. An employee could interact at his or her own pace without leaving the premises or incurring travel costs. Since the 1980s, the standby solution has been videodisc technology. At $6000–$10,000 per videodisc training station setup, however, the cost of such a technology is out of reach of the small-business owner or individual.

Advances in imaging and CD-ROM production technology have made it possible to provide such training to more people at lower cost. At least this is what the long-time professional training company Wilson Learning Corporation is banking on. Since the mid-1980s, Wilson has produced dozens of videodisc-based interactive multimedia programs about the skills that spell success in business: management, leadership, sales savvy, personal effectiveness, negotiation strategy, and others. Wilson is now in the process of repurposing its line of existing "Personal and Professional Development" products into a series of CD-ROM titles, hoping to reach beyond the Fortune 1000 to small-business owners and individuals.

Wilson is publishing ten titles in the series, some of them with Sony Electronic Publishing Company of Monterey, CA. Four titles—*Connect for Success, Sell to Needs, Relate With Ease,* and *Decide for Sure* are available now, with topics about leadership, presentation, relationship selling, and managing emotions in the works.

The personal and professional products are designed to help individuals "improve work and interaction and interpersonal relationships and to learn by doing without risk," says Nancy Brenny, marketing director of Wilson Learning. The ready availability and ease-of-use of CD-ROM also enables just-in-time training, she adds. The product literature promises that the user "will have Serious Fun with full-motion video, real-life simulations" as they confront and solve real-world problems.

Each title follows the familiar instructional design of a self-paced interactive presentation of main points, examples, practice, testing, and reward. The student has the opportunity to interact with personalities such as the overcautious employee, irate customer, irascible boss, or impatient customer. The nice thing about interactive training is that you can interrupt an uncomfortable situation with a single mouse click. These courses can help people who want to practice "people skills" (or for managers who want their employees to practice such skills) without being observed by a teacher or group. Brenny cites the privacy of one's own desktop computer as an incentive for using the product.

The ready availability and ease of use of CD-ROM enables just-in-time training.

The Wilson Personal and Professional Development series is an example of repurposing, a popular and alluring goal to convert existing inventory into interactive multimedia. Although it is less expensive than creating a title from scratch, repurposing is more complicated than pouring existing content into new formats.

When Wilson created its suite of interactive videodisc titles in the mid-1980s, it used its own video production facilities and business theory experts. Developing for CD-ROM, however, required rethinking the development process.

Wilson teamed up with Sony Electronic Publishing Corporation (SEPC) to accelerate production of the CD-ROM titles. Paul Linhardt, manager of new technologies for SEPC, describes some of the steps involved with the conversion. Producing CD-ROMs demands a team that includes a programmer/scripter, video artist, screen designer, and tester.

First, the content assets such as video,

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text, audio, and graphics from the original videodisc product were evaluated and prepared for CD-ROM. This involved deleting references to videodisc interaction (such as "turn the disc over") or downplaying obvious anachronisms (fortunately for Wilson, the "classic business suit" worn by interactive video characters hasn't changed much since the '80s). Some of the videodisc screen artwork and text displays had to be redone in Adobe Photoshop. And, where videodiscs offer full-screen video, CD-ROM versions present quarter-screen versions at lower resolution.

The nice thing about interactive training is that you can interrupt an uncomfortable situation with a single mouse click.

The next step was to reprogram the interaction for CD-ROM playback. It was important to target both platforms—PC and Macintosh—with the least amount of redundant effort. To accomplish this, the SEPC team chose MacroMedia's Authorware Professional because of its cross-platform interface design and scripting capabilities. Production of the CD-ROMs involved using a Sony-developed hybrid formatter that would allow the same disk to play on both Macintosh- (HFS) and PC- (ISO9660) based machines. Because all video clips were in QuickTime, they could reside in one place on the disc yet be accessed by both the Macintosh and PC players. Other file formats such as execution programs, audio files, graphics, and text coexist in both formats on the disk. "It's really impossible to have 100% cross-platform capability without some tweaking," says Linhardt, "and we learn something new every time we attempt it."

An important and often underestimated step is the integration of assets (video, audio, text, and sound) with programming. The process of making sure all elements were synchronized involved many iterations of functional, compatibility, and user testing. The result is that the CD-ROM product has retained the look and feel of the original videodisc project.

Producing a multimedia title requires that more attention be paid to the user's experience than to programming wizardry, according to Linhardt. Users are less forgiving of poor-quality video or graphics than they are with minor programming glitches, although it is important to maintain quality on all fronts. "The end-user experience is primary," says Linhardt. "It's better to move away from dependence on technology and to focus on production values such as video and image quality."

Wilson Learning is proceeding full steam with its own CD-ROM production now, using some of the methods devised by the Sony team and adding some of its own. It is as if repurposing their existing work is giving them practice for creating new titles using interactive digital technology.

The Wilson Learning Personal and Professional CD-ROMs will probably help many managers fulfill their "employee development" objectives, or assist individuals uncovering a better understanding of their own behavior at work. Traditional instructional design, the scaffolding of the Wilson products, is but one approach to learning. It will be interesting to see if Wilson will unabashedly explore the wide-ranging potential of digital media in its products of the future.

For now, though, more interactive training options are coming down off the top shelf and into the convenient reach of a growing number of small businesses and individuals who also happen to own CD-ROM drives. ■

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Croatia

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And you can do this with targets—you can target the community you wish to talk to, those who believe in the same things you believe, or to those who don't believe in the things you believe.

This will help people to gain foreign information and to tell what's going on in the country.

Investing in such infrastructure is very cheap. I told you that we have established a national backbone covering the whole country the size of Norway, with four universities and a hundred new institutions, with eighteen installations, with the national backbone, with two international lines—all of the equipment required was paid with one million dollars.

Croatia has four and a half million inhabitants. More than 10%, more than five hundred thousand people in Croatia, came as refugees, the majority of them from Bosnia-Herzegovina, the majority of them Muslims. So in addition to our population we have more than 10% refugees—try to imagine what this would mean in a country like the United States.

Each refugee costs two dollars a day to provide him accommodation, shelter, and food. Which is one million dollars a day we spend for refugees.

Refugees are consequence of a war. With one million dollars we have established such a network. Try to imagine what we could do with [the money from] twenty days of refugees. And the cost to the world, if the world wants to help make the suffering of these people smaller.

So money that should be spent for information technology is very small. The most important thing is will. And this is something that is bothering me, something that Mr. Toffler mentioned yesterday as well. Do the Western countries really know what they would want to do? What is their objective? What do they want to do about those troublesome countries that don't let them live in comfort and think about some other things, and not how to stop a war in some remote country, whose motivations they supposedly don't know?

Mr. Toffler also has a citation from Mr. Trotsky, who says, "You might not be interested in war, but war is interested in you." This is the reality. You cannot go away from it.

So first of all, we all have to think about what do we want to do in those countries? Yugoslavia is a very mild example. Yugoslavia is not a very big threat, at least I think so, to the rest of the world. Serbia has no nuclear weapons; the chemical weaponry they have is practically limited to the area of ex-Yugoslavia, and they only destroy us. They cannot make a lot of damage to the rest of the world.

But there are countries in the world, and as we've heard these days, people in the world, who are gaining the technology of mass destruction. And we see that more and more in the modern world, wars are terrorist-like. So these are wars to the whole world.

My answer to all of these questions is only education and knowledge. Education should be spread, knowledge should be spread, and communication about individuals. We should try to do everything to reduce the ability that some militant minority manipulates masses. I hope that at least in this room are many more people who believe in the same things. ■

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opened up more and more ways to make their words known, network publishing is a huge jump. You can now publish your words to people in forty-five countries with only a computer and a telephone. That's all it takes.

There are very few generations that get to see the development of a new technology for how people communicate. That generation gets to see all sorts of wild things happen: industries come and go, what it means to be in a family and how companies work changes. All of those things change dramatically based on a new communication technology. I'd suggest network publishing is such a change. It means that you don't have to go through the established hierarchies that have built themselves up around older technologies of information distribution. People can take their photographs of Asia and make it available on the networks and find other people that have similar interests. You can take your MIDI files of music recordings and make those available, and find other people that are interested in your kind of music; and, as we're seeing now, people are starting to do it for pay, not just for free. It's more than just electronic mail or bulletin boards. It's not just conversational. People are putting together real works that are composed and created to work over time. They're not just a snapshot of email.

Is electronic network publishing changing our notion of what a book or document is? It opens the possibilities for customized books, or books that change over time, or books that can be easily read in a nonlinear fashion.

Yes. We're only starting to see some of the new types of literature that will come out of this new medium. As [Marshall] McLuhan wrote, the new medium contains the old medium. So the first thing you do in a new medium is just make a copy of the old medium. Later it will start to evolve on its own. It's hard to know where it's all going, but one way to try to think about it is to look at the different types of books we have. Try to think what would make a really great electronic encyclopedia? Well, it wouldn't just link to the documents within itself, it would also point out to the real world and point to current newspaper articles. Or, look at an atlas. You wouldn't want a static picture of each map. You'd want to be able to zoom in and out, move around, see it over history, and turn different knobs to be able to interact with maps in a new and different way. We'll see every book type and every information type evolve as the market grows up on the nets. The key piece is to make sure there's a market and not just the technology.

One vision for the future is that publishing houses will become a company with a server, providing an outlet for the writer or photographer or musician who does not have their own server.

Yes. Right now it takes quite a bit of technical sophistication to make yourself an Internet node and run these services, but it's becoming easier and easier. There are already service bureaus which make somebody else's catalog available on the Internet through WAIS or World Wide Web.

It will get to the point where small companies or even an individuals' machine will be able to be those nodes. It's becoming easier and easier to run these small-scale printing presses for Internet distribution.

What are some of the other issues network publishing will force us to reexamine?

The world is a dynamically changing environment. The archivists have got some real work to do. I am working with a group of people founding the Library of Alexandria Foundation, which is trying to archive some of the works that are created on the net that were never meant to be printed.

Every librarian has two hats. There's the access hat and the archiving hat. Right now on the Internet we're very heavily biased on the access, but there's cultural changes and sociological changes going on that are not even being documented, they're not being saved, and it's time to start addressing these issues.

Is the question of authenticity of a document part of archiving—being able to make sure the copy you have is made from an unaltered original?

> **When the printing press came along there wasn't the concept of copyright and it took 150 years to get the royalty systems together that we now have for books and newspaper publishing.**

Authenticity on the networks, security, and identity on the networks are all very real problems, and haven't been resolved very well. There are people going onto and making money on these systems that are actually very easy to spoof. So, it's possible to steal on the networks as real commercial enterprises join in. And those access methods really need to be moved towards actually figuring out who is a person and is their money good? Is their Visa card number good or is it just stolen? Those sorts of aspects are still to come.

And digital signatures on documents?

Digital signatures is another technology for authenticating a document. It's becoming less of a problem. If you want to get a copy you go back to the original source, so you don't necessarily have to have many copies of a particular document floating around on the net. You can just reference the original copy on someone's hard drive and when you want it, click on it, and you retrieve the original document one more time from the original location.

In that way it's different from the printing environment where there are copies floating around. They can be altered. In the network publishing model, the publishers control the distribution of their work and they certify the authenticity of the work that they have. That's what a publisher does.

Archiving for the nets reminds me of the evolution of printed material and how systems needed to be developed to manage the growing volumes of information, documents, and books that were being collected. How will we handle all the new information available electronically?

Let me try to answer this by saying that when people are complaining of information overload it means the tools aren't good enough to find only those things that they want to read. And the tools aren't good enough, yet.

We think that making the tools better for searching will include using "editors" to help select works and to let you know that these are the hot articles. You might subscribe to several different editors to help select the different articles that you want to read. Editors will be the next wave of navigation tools on wide-area networks.

The other question is archiving. This is just starting and there is nothing good to say, yet. In terms of actual experience, there are only horror stories of archiving in the electronic publishing world. But what will help on the archiving side is that it is really cheap to archive things. With an $8 tape you can store 5GB.

Is copyright another issue with archiving?

I would say copyright is more an issue of access, restricting access, as opposed to the archiving rule which is how to save it for the future.

We are beginning to see the early battles over electronic copyright, what rights are being bought and sold, and how authors or creators should be compensated.

Yes. Exactly how the compensation structure will work in the electronic world has not been figured out and it will take time. The key piece is that somebody will start making some money somewhere. That's what we are trying to figure out now and we're in the very beginning throes.

We're excited that successful models of putting across content that people will want to pay for on the net, open networks, is starting to happen. All the rest can figure itself out afterwards. It's an important question, but if you don't answer the first one, we don't even have a game to play. ■

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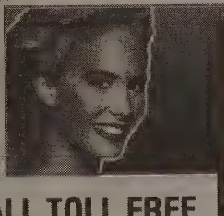

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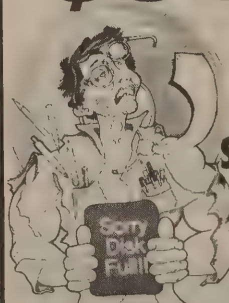
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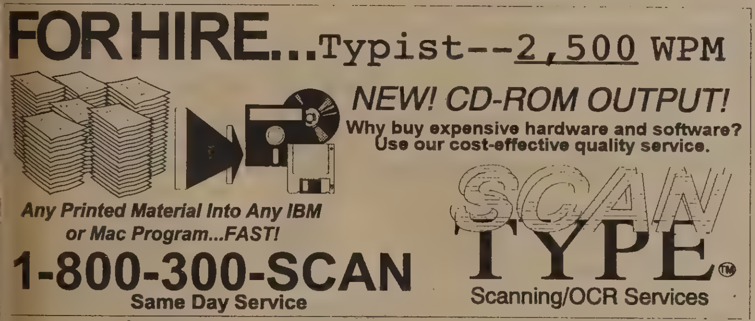

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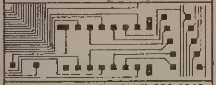

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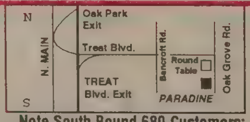

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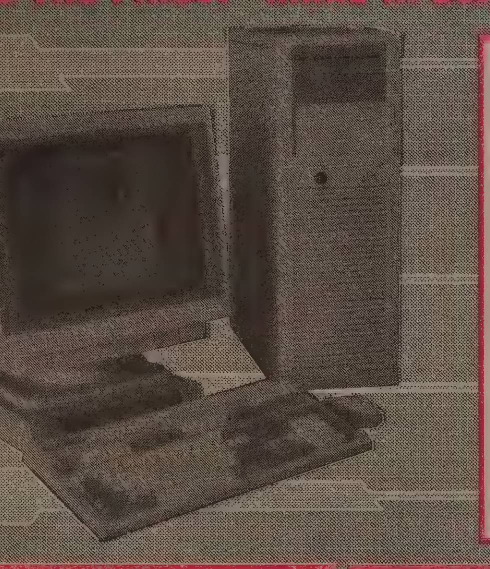

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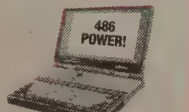

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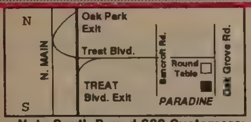

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This is an excellent application for AmigaLink because a fast transfer rate is not a requirement.

continued from page 294

When I rebooted a node, I found that on remote nodes, I had to unmount and then remount any devices imported from the rebooted node. This was so, even though the Import program indicated the devices were mounted. You can click the "mounted" button twice or do it from the CLI. When there are a lot of devices, a script file to unmount devices works great.

I also found a conflict between my Goldengate 486 board and AmigaLink. However, as long as I didn't try to access a device on the Amiga with the GG486 while it was emulating, all was fine.

PERFORMANCE

Since Amiga floppy drives are no speed-burners, I was very interested to see what kind of performance a floppy port network could achieve. The manual states that the data transfer rate is 450,000 bits-per-second, which translates to about 55 kilobytes-per-second (kbps). My best case was a disappointing 40kbps on my network, while ParNet achieved around 61kbps.

However, this is only half of the story. During transfers, ParNet hogged CPU time, while AmigaLink barely required any. So although AmigaLink is slower than ParNet, it uses substantially less system resources, which could be a factor when multitasking. Still, AmigaLink is just fast enough not to cause an anxiety attack.

VIDEOTOASTER FARM

Spectronics is also considering releasing software to do simultaneous Lightwave rendering on multiple Amiga/Toaster systems. This is an excellent application for AmigaLink because a fast transfer rate is not a requirement. "Rendering farms"—just like the big boys (i.e., Amblin Imaging [*seaQuest DSV*] and Foundation Imaging [*Babylon 5*])—are now within the reach of smaller 3-D studios.

WORTH THE PRICE

This is an extremely important product for the Amiga. At $299 for a two-node network, AmigaLink may seem a little expensive, but a functionally equivalent Ethernet-based network would cost you many times that. AmigaLink performs like a full-fledged network—albeit a little slower—and is well worth its cost. ■

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10
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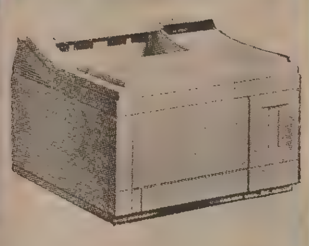

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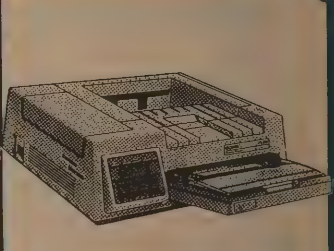

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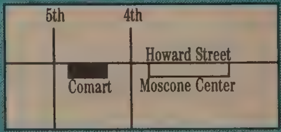

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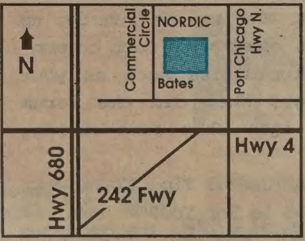

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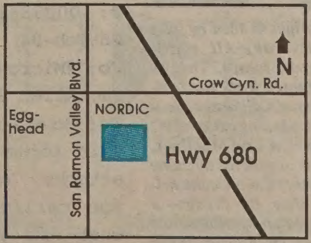

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The Information Highway Is A Bumpy Road

or Isn't Flaming Fun??

BY JOHN C. DVORAK

DVORAK'S LAST COLUMN

I went online the other day and downloaded a typical online forum discussion. Folks, this is what the Information Superhighway is really all about!

#: 0003859 S1/General Information 26-Feb-94
Sb: #Microsoft Hatred
Fm: Barry Manilow 96543,99
To: Gene Buffoon 98881,19
You're so full of crap that your eyes are turning brown. Carol has done a fine job researching her book. I've seen pages I tell you. They're good and they nail Microsoft to the wall. You have a habit of making up facts as you go along! Where do you get these facts? From Microsoft! You're a stooge for the company.
Barry
There is 1 Reply.

#: 0003860 S1/General Information 26-Feb-94
Sb: #Microsoft Hatred
Fm: Gene Buffoon 98881,19
To: Barry Manilow 96543,99
Up yours butthead. I'm no stooge, either. I'm a retired mechanical engineer and my real name is Gene Buffoon as silly as it may sound to you. In fact it's a grand English name in the highest tradition. My father was Marmaduke Buffoon, Earl of Campbell. But that's beside the point. In fact Carol is a stooge for IBM. Check her record and you'll see she worked there and before that with Digital Research. The book is full of lies.
There are 2 Replies.

Copyright © 1994 by John C. Dvorak. All rights reserved. John C. Dvorak graduated from the University of California. He is a contributing editor of PC Magazine *and* MacUser, *and is considered by many to epitomize the contrarian view of things—a charge that he vehemently denies. Dvorak's motto is: If you have nothing nice to say, then don't say anything at all.*

#: 0003861 S1/General Information 26-Feb-94
Sb: #Microsoft Hatred
Fm: Allen Simpson 97453,221
To: Gene Buffoon 98881,19
This forum is no place for personal attacks. You're a first grade jerk for calling Barry a butthead. And what are your credentials for even knowing the first thing about Carol and her book or who she worked for? Are you a private detective?
There is 1 Reply

#0003862 S1/General Information 26-Feb-94
Sb: #Microsoft Hatred
Fm: Angelica Forsyth 98881,19
To: Allen Simpson 97453,221
I think you are being too harsh on Gene. He is a very bright and talented man who knows and understands many things. He is handsome, articulate and thoughtful. He would never say anything that wasn't 100% right on the money.
Angelica

#: 0003863 S1/General Information 26-Feb-94
Sb: #Microsoft Hatred
Fm: Edgar Cayce 94530,312
To: Gene Buffoon 98881,19
You are adding way too much negative energy into the collective superorganic orgone fields of pink and blue light. Back off! Creep!

#: 0003860 S1/General Information 26-Feb-94
Sb: #Fakes on-line
Fm: Barry Manilow 96543,99
To: All
Did anyone notice that Angelica has the same ID number as Buffoon!!

#: 0003865 S2/Useful Tips 27-Feb-94
Sb: #Which OS is For You?
Fm: Gene Buffoon 98881,19
To: Homer Simpson 99943,4331
I lost track of the thread. What do you mean "Eat my shorts?" What's the point of THAT comment?

#: 0003866 S2/Useful Tips 27-Feb-94
Sb: #Which OS is For You?
Fm: Marilyn McKesson 94530,312
To: Gene Buffoon 98881,19
This is supposed to be a forum of useful tips. Why are we running up the messages count with dumb commentary and stupidities such as your last message? When did the forum degenerate into this name-calling nonsense?

#: 0003867 S2/Useful Tips 27-Feb-94
Sb: #Which OS is For You?
Fm: Michael Mossman (IBM-Ind) 90006,2121
To: Charlotte Charles 90101,287
Sorry it took me so long to get back to you. There are patches on the IBM forum that solve your problems. Download patch9x.zip and take the device driver called dd89-8_a.dev and add it to the 37th line of the CONFIG.SYS file that was first provided with your system. Then rename the old CONFIG.SYS to CONFIG.OLD and run the program CHANGE.EXE giving the parameters /c/e/44(a) at the end of the execution string. Make sure both the CONFIG.SYS and CONFIG.OLD are in the same directory. CHANGE.EXE will make a new CONFIG from the two old CONFIG files and change the old CONFIG.OLD to CONFIG.BAK and make the old CONFIG.SYS to CONFIG.BA0. After you reboot this should finally make the Scroll Lock light turn off. If it is still lit then it's something Microsoft is doing with Windows that's the problem.
:) Mossman :)

#: 0003868 S2/Useful Tips 28-Feb-94
Sb: #Which OS is For You?
Fm: Charlotte Charles 90101,287
To: Michael Mossman (IBM) 90006,2121
I tried using CHANGE.EXE and got an error message.

#: 0003869 S2/Useful Tips 28-Feb-94
Sb: #Which OS is For You?
Fm: Dudley Pimental (team USA) 90000,3546
To: Charlotte Charles 90101,287
Did you run the latest version of CHANGE.EXE? I think you may have downloaded an old version of Patch9x.zip. Make sure the one you get is dated Jan 15 or newer.

#: 0003870 S2/Useful Tips 28-Feb-94
Sb: #Which OS is For You?
Fm: Charlotte Charles 90101,287
To: Dudley Pimental (team USA) 90000,3546
Thanks

#: 0003871 S2/Useful Tips 28-Feb-94
Sb: #Which OS is For You?
Fm: John C. Dvorak 96969,206
To: All
Having spent an hour reading the last couple of days' threads I want to thank you all for the enlightenment. As usual on the Information Highway I learned nothing. Have a nice day. ■

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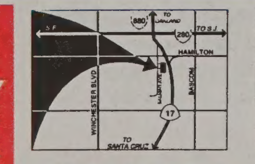

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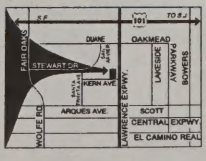

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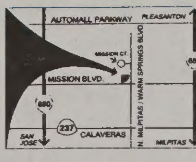

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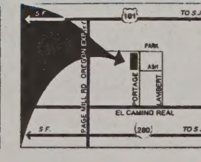

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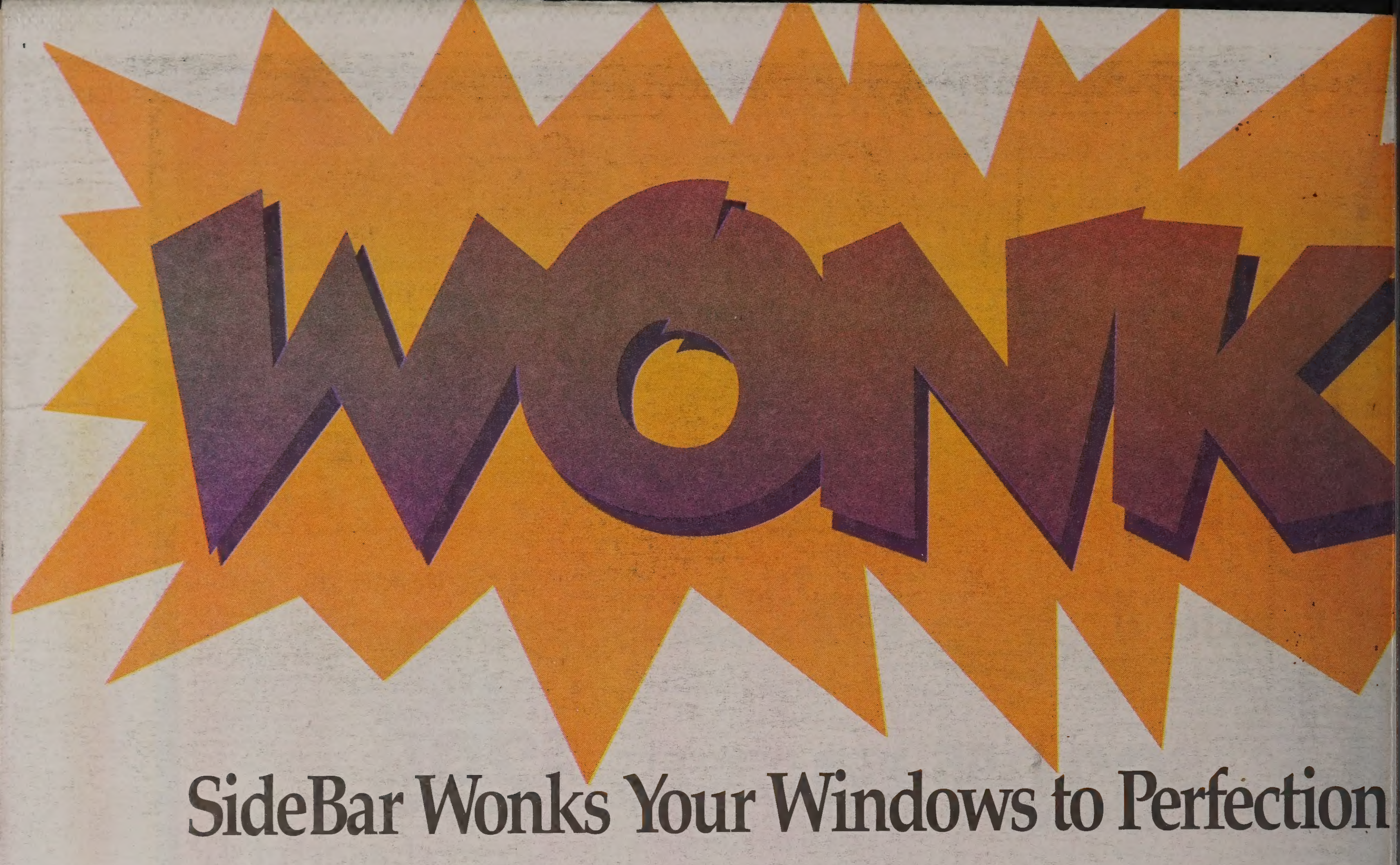

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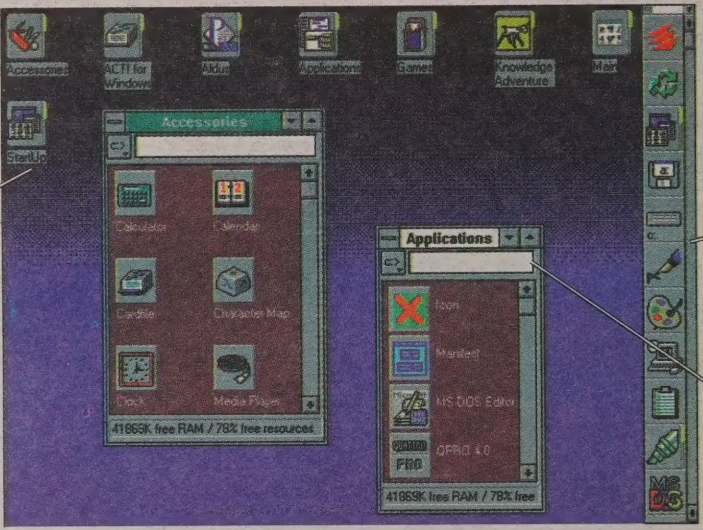
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